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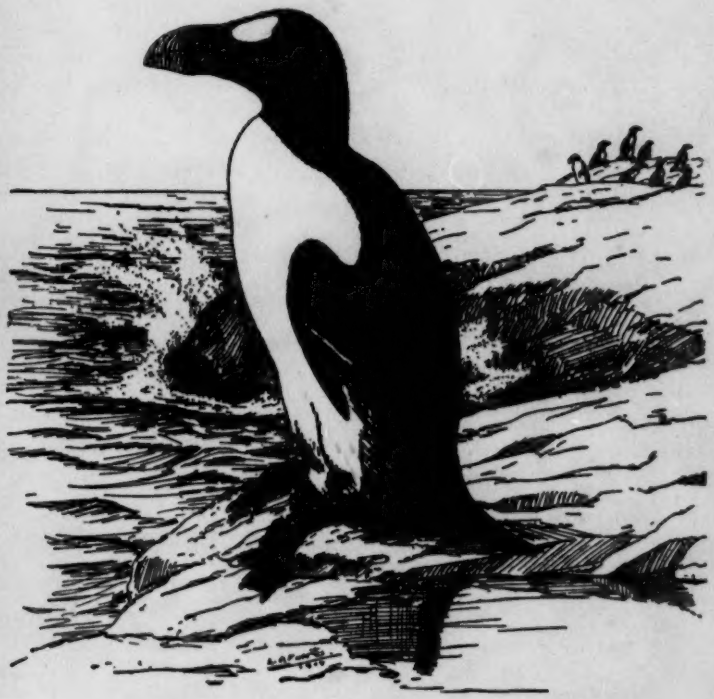

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UPPER.—MALE SOOTY GROUSE, PERFORMING.
LOWER.—SAME BIRD ONE MINUTE EARLIER.

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VOL. XLVI. JULY, 1929. No. 3.

SUMMER NOTES ON THE SOOTY GROUSE OF MOUNT RAINIER.

BY R. A. JOHNSON.

Plates XII–XIII.

DURING the summer of 1926, between the dates of June 15, and September 20, frequent observations were made on the habits of the Sooty Grouse (*Dendragapus f. fuliginosus* Ridgw.) of Mount Rainier, Washington. The summer range of this species is restricted to the alpine meadow zone, a habitat extending around the mountain approximately between the elevations of five thousand and six thousand five hundred feet. The ground cover of this habitat consists largely of heather meadows, small mountain ash, and mountain willow thickets interspersed with clumps and individual trees of alpine fir (*Abies lasiocarpa*) and mountain hemlock (*Tsuga mertensiana*), the branches of which usually droop so that the lowest ones touch the ground.

The 1926 season was two or more weeks early for the wild flowers, the snow having disappeared in Paradise Valley by June 15. Such an unusually early season may have affected the breeding season of the birds although I consider it doubtful.

During the latter part of June I saw several individual female Sooty Grouse around Paradise Valley and Paradise Camp. These birds moved about leisurely, quietly feeding, and seemingly unafraid of man. If pursued, they usually made their get-away on foot and were only induced to flight by a close chase and even this flight terminated in the branches of a nearby tree.

The male Sooty Grouse, commonly called "hooter" because of the character of his call, is seldom seen with the female after the egg laying season, except in instances where a second brood is raised. Often the "hoot" of the male is mistaken for that of an Owl. It is made after the bird has assumed a half strutting attitude with the air sac on each side of the neck inflated, so that he resembles somewhat a cooing Pigeon. During an extended observation of one of these males I noticed that each performance consisted of five distinct hoots, the first and the last of which were of two syllables, and the three intervening ones of one syllable, thus: "Ooh-whoo, whoo, whoo, whoo, ooh-whoo." The bird is perfectly willing to be disturbed. It will fly to the branch of a nearby tree, or walk a few yards to one side and then, often quite unconcerned in the presence even of a considerable audience, inflate the large air sacs of the neck and utter this guttural hoot, which, because of its peculiar quality sounds far distant even though it may be uttered only a few yards away.

With regard to the broods of the Sooty Grouse I may mention the following records from my notebooks.

On June 28, a brood of chicks just out of the nest was sighted.

On August 4, a female and five chicks one third grown were found feeding near Sluskin Falls; elevation 6000 feet. In these chicks the main tail feathers of the adult plumage were beginning to show.

On August 11, a female and three half grown chicks were seen at an elevation of 5300 feet. The chicks were feeding on insects. Their adult tail feathers were half way out. On the same date, a female with three small chicks, estimated to be ten days old, and evidently a second brood, was found feeding on insects at an elevation of 5300 feet.

On September 3, a female with seven young about three-fourths grown was seen at an elevation of 5000 feet. The young resembled young Turkeys with adult tail plumage complete, and feathered tracts on the necks.

On September 6, I observed a brood of Sooty Grouse going to roost. I located them by their low cackling noise which is often heard at such times. This cackle is a subdued one and is somewhat similar to that of the domestic fowl, except for the absence of

FEMALE SOOTY GROUSE IN TREE.

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the outbursting notes with which the domestic hen ends her performance. In going to roost each bird settled upon a thick mat of branches about eight feet from the trunk of the tree and from twelve to thirty feet from the ground. In this position their dusky color blended somewhat with the moss and lichen-covered branches. The birds settle singly, usually with the head turned toward the tip of the broad frond-like branch upon which they perch, yet concealed for the most part by overhanging branches.

With regard to local distribution, several broods were successfully reared in Paradise Valley and the outskirts of the large Paradise Camp grounds, but I saw the Sooty Grouse seldom in other parts of its natural range.

I believe that there was an unusual concentration of birds within a narrow zone around the camp ground, and that probably the birds were there enjoying the measure of protection from their natural enemies which they found in the shadow of this human habitation. Certainly these birds were not attracted by food for not once did I see them come to secure any food distributed by man.

On September 8, eight inches of snow fell in the habitat zone of the Sooty Grouse. This remained and increased to ten inches on September 17. When the snow fell the broods were still together, but as the snow deepened they immediately exhibited a certain confusion by aimlessly wandering about. By September 20, broods had lost their identity and the birds were found for the most part singly or in pairs, perched among the higher branches in the clumps of alpine fir and hemlock.

The Manlius School,
Manlius, N. Y.

NOTES ON THE UNIQUE METHODS OF NIDIFICATION OF THE AUSTRALIAN MALLEE-FOWL (*LEIPOA OCELLATA*) WITH ORIGINAL DATA SUPPLIED BY BRUCE W. LEAKE, R. A. O. U.

BY EDWIN ASHBY, C. F. A. O. U., M. B. O. U., F. L. S., ETC.

Plates XIV–XVI.

Introduction.—The chief object of the writer in presenting this paper, is that the data obtained by Mr. Bruce W. Leake, R. A. O. U., of "Cardonia" Kellerberrin, Western Australia, in connection with the methods of incubation of the Mound Building Mallee-Fowl of Australia, might be preserved in some scientific journal, he having courteously allowed me to quote from his written notes. But before dealing with the data supplied by him I will give a few extracts from my own paper "Notes on the Mound-Building Birds of Australia" published in 'The Ibis' for October, 1922, pp. 702–709. These notes on *Leipoa* were not only my personal observations but also data supplied to me by my correspondents. The Mallee-Fowl inhabits almost exclusively the vast tracts of the drier parts of Australia which are covered with various species of the dwarf, branching forms of eucalypti known as mallee, as well as large bushes or dwarf trees representing several other genera.

All the opportunities that I have personally had of examining the nesting-mounds of this bird have been in the extensive belt of Mallee lying on both sides of the river Murray in South Australia.

The birds usually select a sandy rise and commence the nesting-mound by excavating a hole; in the case of the one I examined in this stage, the excavation was about eighteen inches deep and about six feet across. For some reason the birds had forsaken this spot at this stage and made a nesting-mound on another sandy rise some distance away. In reference to the digging of the hole for the foundation of the future mound, Mr. G. H. Mann wrote me: "From my observations it seems that they scratch out a hole early in the winter and then fill it up with a cone-

shaped heap of dry leaves and sticks; these they cover with sand about the end of the winter."

Mr. J. E. Lewis Machell, of the Education Department, Adelaide, wrote: "Nest, fifteen feet in diameter and about two feet six inches high, situated in an open space in a scrub of so-called 'broom' (*Melaleuca uncinata*) with occasional mallee; soil sandy. Composition of nesting-mound, central portion decaying leaves and vegetation covered with sand. There is a depression in the center, the eggs are laid around the rim of this hollow. Before making the nest a small hollow is scraped out; the one I mentioned was only about five inches deep and two feet six inches wide, and was filled with leaves and twigs.

"The eggs did not appear to be laid down as far as the leaves. Many were standing on end, but not all. I may have disturbed them when opening up the nest. The sand was fairly dry where the eggs were, but not as dry as in other parts of the nest . . . About 10 A.M. (when the sun was shining directly on the nest), the male and female appeared on the mound. The female stayed, but the male disappeared into the scrub again to do 'sentry-go.' Well, Mrs. Mallee-Fowl began to open out the egg-chamber; every few minutes she would pause and appear to settle her neck and breast against the sides of the egg-chamber.

"The sand was cleared away until there was about an inch left covering the eggs, then the male joined her and both disappeared. On visiting the nest at 4 P.M. (the shadows were just on the nest), I found that the sand had been replaced."

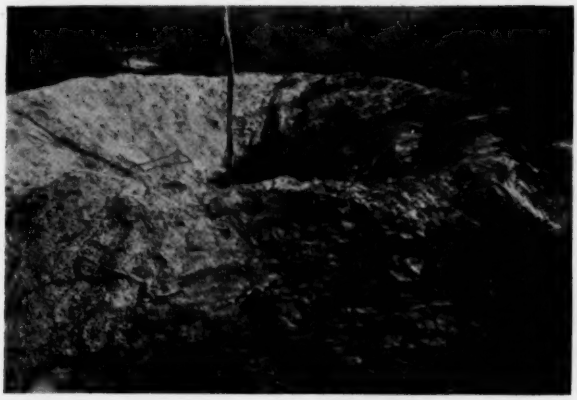
Mr. T. P. Bellchambers of South Australia wrote me: "All covering material is mixed with desiccated leaves. For sunning purposes, i.e. 'solar heat', the nest is opened almost to the level of the eggs—this may be done as often as five days out of seven. The refilling is a gradual process and takes all day, as it is replaced in layers as soon as it gets hot. The male does all the hard graft, grasps and throws all the material behind him."

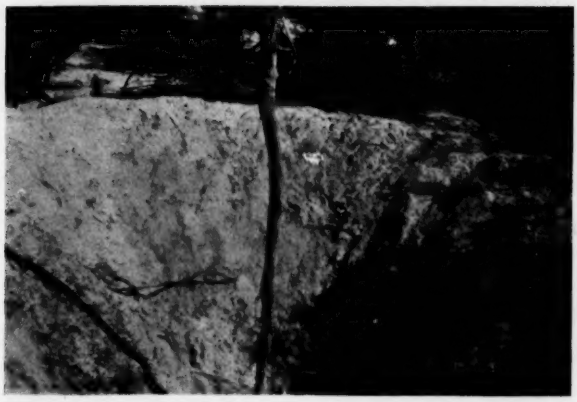
Leake's notes.—Mr. Leake supplies data to show that in 1869 the Mallee-Fowls were numerous in the Kellerberrin District, and were often shot for food by the settlers. The birds became scarce during the three years ending in 1879, a period of low rainfall, and during the cycle of dry years 1894 to 1902, when the average

rain fall was 10.5 inches, the birds became practically extinct in that district. The rainfall has increased since 1915 and averaged about 15.25 inches for the ensuing twelve years. During this period the birds returned to that district in considerable numbers; Mr. Leake suggests that this may have been partly due to the drought conditions prevailing in the Murchison District much further north. In September 1925 he spent some time searching for Mallee-Fowl nests but only found four old mounds, but to quote his own words: "A few days later Mr. Noye, who is very observant of bird life, told me that he had two years before seen a nest with broken egg shells. On examining this old nest, fresh scratchings were at once seen all around the nest, which was in the same stage as shown in Plate XIV, fig. 3. The birds had not commenced laying. The nest was situated in a sandy piece of soil immediately adjoining some old rabbit burrows. The bushes were not thick immediately around the nest, but a little further back, dense scrub surrounded it entirely. On October 17 when the first egg was found the circumference of the nest at the base was 37 ft., and the height from the ground level to top of mound in the centre was 2 ft. 6 in. The egg is a beautiful pinkish color when freshly laid measuring 3.5 x 2.5 in., and was placed perpendicularly some eighteen inches below the top of the mound, the big end being upwards. A visit on October 24, revealed two more eggs."

I had always understood that the incubation period was about forty days, and being anxious to secure the young, I decided to make a nesting mound near Cardonia, about twelve miles distant from the nest, and transfer the eggs. I had heard of two cases where nests were wire netted to endeavour to secure the young, but these had died in the egg shells, due, no doubt, to the parent birds not being able to open out the nests. A sandy spot for an artificial nesting mound was chosen in my orchard a few chains from the house.

Making the nesting mound.—I had previously carefully examined old nests, also the new one. A hole was made in the sandy soil, one foot deep and two feet wide. This was filled up with jam-tree leaves (*Acacia acuminata*) and other rubbish raked up from beneath the trees. On these leaves water was poured till the





UPPER.—MOUND OPENED BY BIRDS AFTER RAIN.
MIDDLE.—CLOSER VIEW (STAKE INSERTED FOR MEASURING).
LOWER.—MOUND FILLED WITH LEAVES, ETC.

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hole was filled. This operation was repeated several times during the day, as the leaves gradually absorbed the water and the rest soaked away. Tubs were procured and more leaves were placed in these and soaked in water all day. During the day the leaves absorbed a quantity of water, and towards the evening the hole two feet wide was built up six inches above the ground with soaked leaves. Around this heap another circle of wet leaves about twelve inches thick was packed and brought up one foot three inches higher than the first heap, no more leaves being put on top of this. A chamber which I reduced from two feet to twenty inches wide and one foot three inches deep, was thus left, this being for the reception of the eggs. The sand was then shovelled all over and around the leaves and piled up to the height of a foot and a half above the egg chamber, a small mesh netting three feet high was put around the base of the mound and around this netting a bush fence to break the winds, was built over three feet in height.

The bird's nesting mound.—The Mallee-Fowl continued laying eggs at the rate approximately of two per week, and I marked these with the date, as they were laid. Their egg chamber was twenty inches wide and the eggs were laid about three inches apart in irregular formation and all on almost the same level. Sometimes an egg would be noticed on a slant and perhaps the next visit would disclose it quite upright. The eggs were all marked with scratches from the birds' feet. On one occasion early in November I was digging out the nest when a movement was heard in the bushes, and on looking up the parent bird could be seen approaching. It looked very handsome but rather bedraggled about the tail and end of wings. It advanced to within ten yards and watched me for a few minutes, then went away and came up from another direction and did the same thing. Three days later I was much surprised to find a layer of sticks right across the nest about six inches below the top of the mound. The birds had evidently looked on me as an intruder and were endeavouring to prevent my getting the eggs. One of these was found broken in the nest. This was the only time during the season that sticks were put across the nest and an egg broken.

Temperatures and transference of eggs.—On November 15, on

which date my mound had been made three weeks and the wet leaves had become heated, I tested the egg-chamber with a thermometer and it registered 90 degrees Fahrenheit. The next day I tested the birds' mound and it registered the same temperature. There did not appear to be much humid heat in their egg-chamber, the leaves and rubbish being only in a slightly mouldy condition which I think was due to a very light rainfall (only 28 points fell in August and 113 in September) and the material had not been thoroughly soaked. On November 21 I transferred six eggs, to my mound leaving only two in the nest, care was taken to keep the eggs warm and on their ends during the journey of twelve miles. On testing the birds' mound during the operation, the thermometer soared to 98 degrees, and the only conclusion I could come to was that the birds had, just previous to my visit, opened out the mound and let down some hot sand from the top. One hot morning a few days later I found the birds' mound flattened off at the top as shown in Plate XV, fig. 2, and this was repeatedly done on bright warm days; on cold dull days the mound was always higher as in Plate XV, fig. 1.

I placed the six eggs carefully in my nest almost touching the warm leaves at the bottom of the nesting-chamber and covering it all up with sand to a depth of eighteen inches above the eggs. Plate XV, fig. 3 shows how the mound then appeared, the temperature still being 90 degrees. The weather was cool at the time and two days later just before sundown I opened out the mound and found that the temperature had fallen to 87 degrees. I filled a box with hot sand from the surface of the mound, this registered 99 degrees, and after removing all the eggs and sand from the egg-chamber, I poured in the heated sand, replaced the eggs and covered with the balance of the heated sand. This operation was repeated every second or third afternoon, or if very busy occasionally after tea. Once a shower of rain fell with damp weather following so that I could not get hot sand for four days and the temperature of the egg-chamber fell to 83 degrees, the lowest record during the period of incubation. The temperature of the egg-chamber was continually tested and it was found to vary from 94 to 104 degrees according to the weather at the time. I never attempted anything warmer than 104 degrees. December

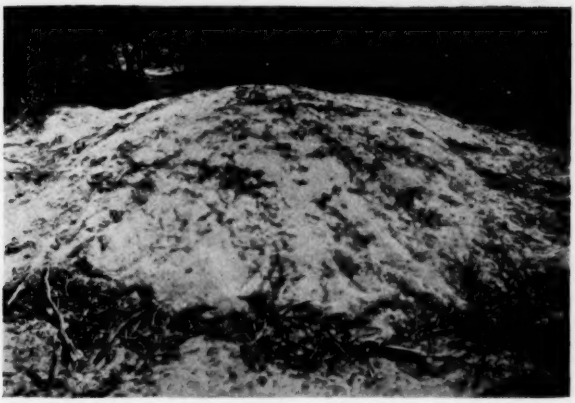
and January brought some very hot days, the average temperature at Kellerberrin being 96 degrees during the latter month. One morning at seven o'clock I flattened the top off, as the birds did to their mound, leaving about a foot of sand above the eggs, late in the afternoon the thermometer registered 95 degrees in the egg-chamber and after filling it up again the mound was raised high to keep in the heat during the night; this method I continued to follow on succeeding warm days registering in the shade 92 to 102 degrees, and found that the egg-chamber would invariably register 93 to 96 degrees and it was only when two or three cold days followed each other that I was obliged to put hot sand on the eggs. Even on cool days the sand right on top of the mound would be warm enough to replace that below, which was gradually being reduced. In any case I always scooped out the sand every second or third day to see how the eggs were and at the same time record the temperature. Plate XVI, fig. 1, shows the egg-chamber opened.

Period of incubation.—Previously I have stated that when I transferred the six eggs two were left in the nest and subsequently the bird laid two more, thus making a total of eleven including the one found broken in the mound. The first nine eggs were laid on an average of about two per week, then there was a gap and the last two were laid approximately on November 26 and December 26, respectively, the first laid was smaller than the other but the coloring of the latter was less bright.

The four remaining eggs were transferred to my nest on December 12, making with those already there a total of ten. By this time the heated leaves below and surrounding the egg chamber had become almost dry and the eggs were practically incubating in the hot sand fed by the sun's rays. Eight weeks had passed from the time the first egg had been laid and it looked as if the eggs had been rendered useless by my amateur methods. On breaking one, however, the chick was found to be alive and within a few days of hatching. On the morning of December 21, a chick was found in the mound and it must have been only a few minutes previously that it had broken up the shell into small pieces. It stood in an upright position, just as it would have been if the egg was still intact. The chick was very damp, almost

wet, and covered with a slimy substance which would be a natural protection to the feathers when scrambling through the hot sand; the young bird was taken out and partly covered with warm sand, until it was quite dry, which was in about an hour. It did not seem satisfied unless it had its beak partly buried in the sand, and its legs bent tightly up against its body. When dry it gave some vigorous kicks and endeavoured to get away if held, making at times a gurgling sound, it would run a little way then squat like a young Plover. On examination it was found to be plump, fully feathered, including small, well developed wings and a short, stumpy tail; the coloring very similar to a Ground Lark (*Anthus australis*), and shape like a Quail. It was placed in a netted aviary and most of the day was spent just squatting. In the evening just before twilight it became quite alert, ran about and once flew to a height of three feet, evidently seeking a bush to settle on to spend the night. The next day it drank some water, ate some seeds and scratched the ground first with one foot and then the other and became lively again in the evening (see Plate XVI, fig. 2). On December 26 about 10 A.M. a second chick was found, dry and fresh looking, in the netted enclosure around the mound. It had hatched out and after being dried by the hot sand surrounding it, had scrambled up through the mound; by the mark where it had emerged the course taken was almost perpendicular. This young Mallee-Fowl was placed with the chick hatched five days previously, the latter ruffled its feathers, spread out its wings and would not go near the fresh arrival, it taking two days for it to get accustomed to the newcomer. This must show that the young birds lead an altogether independent existence and never even know their parents.

By January 8 more chicks had hatched out; then I was away from home for a week. During my absence the mound was flattened off in the morning and piled high again late in the afternoon, but it was not opened out. When I opened out the nest on my return one chick was found dead in the egg chamber, the shell not having broken into fragments small enough to release it. The egg-chamber registered 95 degrees, and this was the only occasion that the mound was not opened out every second or third day. To me it seemed to show that exposure of the eggs to the



UPPER.—MOUND AFTER FIRST EGGS WERE LAID.
MIDDLE.—TOP FLATTENED OFF ON WARM DAY.
LOWER.—ARTIFICIAL MOUND MADE AT CARDONIA.

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air must play an important part, as the sand was still loose on top and around the egg. On January 31 another chick was found in the netted enclosure. My son had difficulty in catching it, and twice it flew nearly over the three foot netting. The remaining two eggs proved to be addled. The period of incubation varied from 59 to 63 days. Of the six chicks two unfortunately died at the beginning of January through my not knowing the proper food to rear them on. Three of these were a little lighter in color than the others, they were all quiet and could be easily caught and handled until they were two weeks old, after which they became timid and did not like being touched. At the age of three and four weeks the bronze feathers gradually grew in amongst the other feathers and an altogether new tail developed. After a time greyish feathers and black stripe down the throat and the breast also appeared.

Call notes.—These Mallee-Fowls, now over a year old, make three different notes. One which they utter when young is soft and low, the second is like a human being belching in the throat backwards, and the third is a boom like a tame Pigeon, only much deeper and louder; this latter note is not made until they are nine months old. When making this sound, it appears to be hard work: as the body expands the head is bent right down near the ground and almost between the legs. At this age, over a year, the sexes are still indistinguishable and they possess a restless energy which together with their sturdy build and powerful legs and feet, makes them well fitted for the stupendous task of constructing and working their nesting-mounds.

Every evening as dusk is falling, they run about the aviary rapidly and often fly to the top and cling to the roof netting which is six feet above ground.

The parent birds did not appear to notice that there were no eggs in their nest after the last two had been removed on December 12 and continued working the nest right through that month and also January. On February 9 on approaching the nest a Mallee-Fowl was noticed there; and creeping up I got within a few yards without its seeing me. The time was about 4:30 P.M. on a very hot day, the sun beat mercilessly down on the sandy nest, the bird was raising the mound by scratching the sand

first with one foot and then with the other and gradually working around the nest, all the time making the belching note similar to that made by mine in captivity. The bird would scratch for about five minutes, then walk right down off the mound panting, and squat down in a hole three or four inches deep, made by it for this purpose. After a short rest it would resume its efforts and when again in need of a spell it would some times disappear down the opposite side of the mound, where there was another rest hole. After watching for some time, I approached when it was resting and it disappeared like a flash.

Can the Mallee-Fowl live in their natural state without water? Being partly insectivourous they can obtain a deal of moisture that way, but that any bird can work in the heat on the burning sand like this one does and live without water, seems impossible. I have waited at a soak in my paddock not far from the nest to see if they drink there, from late in the afternoon till dark, and again have been there at dawn, but without any sign of the Mallee-Fowls. According to my informants they do drink at times, but I cannot agree with those who suppose that they do so under cover of darkness, because they cannot see any better than a domestic fowl at night. Old nests are often found many miles from water but as a rule in this district they are within a mile or so of granite rocks; after a very light shower the birds could always get a drink there if they wanted one.

My tame birds drink water but do not require it so frequently as Finches, Parrots and Pigeons. They have a great liking for succulent food such as grapes and watermelon and perhaps when wild they get moisture from the juicy cookine-root and the fleshy Parakeelya (*Calandrina*), growing along the salt lakes and to a lesser extent elsewhere.

Discussion.—Mr. Leake's observations help to fill some of the gaps in our knowledge of the methods of nidification of the Mallee-Fowl, and his success in imitating so closely the habits of these birds as to successfully hatch and rear the young without any assistance from the parent birds, is I believe quite unique. But I differ from him in his impression that the vegetable matter that is incorporated in the nesting material serves in some, although probably only in a small, degree, to raise the temperature of the

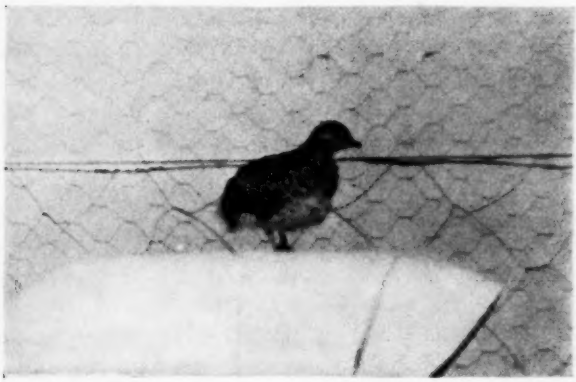
mass. My experience in the dryer parts of Australia is, that the heat generated by massed vegetable material is of short duration, and I am confident that the limited amount and inadequacy of the vegetable material used by the *Leipoa*, is quite ineffective in this direction and cannot contribute to the raising of the temperature of the nesting mound. The truth of this conclusion will be still more evident when it is remembered that the deposition of the eggs extends over several months without the addition of any more vegetable material. Mr. Leake concurs with other observers that the main factor in the incubation of the eggs is in the conservation of "sun-heat" by the piling up heated sand above the eggs. I can confidently affirm in respect to the nests opened by myself in the dry Mallee country in South Australia, that the meagre amount of vegetable matter incorporated in the sand of the nesting-mound, could add nothing by fermentation to the temperature of the nest. To return to Mr. Leake's notes, it will be seen that during his absence for one week following January 8, the nest was not opened up to the penetration of the sun's rays, and on his return "one chick was found dead in the egg chamber;" also he mentions two cases in which the nests had been netted in, so that the parent birds were unable to have access to the nest, with the result that all the chicks failed to hatch and were found dead in the eggs. It is evident that Mr. Leake's success was entirely due to his care in utilizing sun heat; it will be noted that on November 15 Mr. Leake records that the artificial nest of his own construction, then only three weeks old, was the same temperature as that of the birds' nest that had been in use for a long period.

One then asks the question why do the Mallee-Fowl collect the meagre amount of leaves and twigs available to them in the dry country in which they live? Does this vegetable matter serve any useful purpose? I suggest that there is a possibility that it may serve the purpose of drainage, should a heavy rain occur, which at the nesting season is somewhat unusual. I am, however, more inclined to believe that it serves little if any useful purpose, that it is in fact, purely a vestigial habit. In my earlier paper (l. c.), I pointed out that the interior of the Australian continent, although now so dry, possessed in the distant past a tropical or

subtropical climate with heavy rainfall, and that the dwarf eucalypti known as "mallee" are probably aberrant representatives of an ancient forest.

I submit that we are justified in assuming that the ancestors of the present Mallee-Fowl, like their congenors *Megapodius* and *Alectura*, used to obtain the needed heat for the successful incubation of their eggs by means of fermenting vegetable matter. That the present method of utilizing sun heat, is a case of remarkable adaptation made necessary by changed ecological conditions. That instead of its present method of nidification being a primitive habit—a relic of its reptilian ancestry as some writers have suggested, it is really a highly specialized habit of comparatively recent adoption.

Care of young.—I do not like to conclude this paper without supplying a personal observation under this heading. All observers agree that the young of the *Leipoa* are hatched well feathered and able both to run and fly, in fact to fend for themselves. It has always seemed strange to me that the parent birds should exercise such insistent care and oversight during the incubation period and then, as some writers have supposed, entirely neglect their young. The following observation suggests the existence of some parental oversight. In October 1927 the writer made a trip down the Government Rabbit Proof Fence from Yalgoo to Ajana in the Murchison District of Western Australia. The trip occupied one week, the party consisted of two, the Government Inspector and the writer and the conveyance was a camel buggy. Only two settlers' houses were seen during the journey and unfortunately the two camels strayed away so effectually that they were lost for over twenty-four hours and it fell to my lot to start at early dawn to walk along the fence for seven or eight miles to the only homestead, probably, within a hundred miles, to get assistance in the search for the straying beasts. During that early morning walk I saw a number of Kangaroos, Euro and Emus and as I neared one of the bends in the fence I noticed an adult Mallee-Fowl on my side of the fence and a young one, perhaps a quarter grown, of the same species on the other side. I was walking at a good pace and think I must have been about thirty yards away when the adult bird walked to the young one, the fence



UPPER.—EGG CHAMBER OPENED UP TO SHOW POSITION OF EGGS.
MIDDLE.—CHICK LESS THAN A DAY OLD.
LOWER.—MALEE FOWLS THREE TO FOUR MONTHS OLD.

SMITHSONIAN INSTITUTION

dividing the two, and in doing so came a few yards nearer to me; the two birds appeared to almost touch beaks through the wire netting and the adult seemed to say something to the juvenile, for while before it had been most anxious to get through the fence to the parent bird, immediately the contact had been made, it turned round and ran with great rapidity at right angles to the fence; the adult bird then turned round and slowly and sedately followed the fence in the same direction as that in which I was traveling, I being able to reduce the distance between us by continuing my pace of about four miles an hour, but as soon as the young bird was out of sight, the old one turned off at a rapid pace into the scrub.

There were two things that specially interested me in connection with this incident. (a) The adult bird conveyed a warning to the young one. If vocal I did not hear the sound, but it might have been by contact, for the parent bird actually came towards me in its effort to reach the juvenile and convey the needed warning. (b) The leisurely movement of the adult bird was quite a new experience to the writer, for heretofore when disturbed they have run off at speed. I could not do other than conclude that the leisurely movement was to occupy my attention and allow the young one sufficient time to get safely away.

"Wittunga," Blackwood, South Australia.

SOME PROCEDURES IN CARING FOR A RESEARCH COLLECTION OF BIRDS.

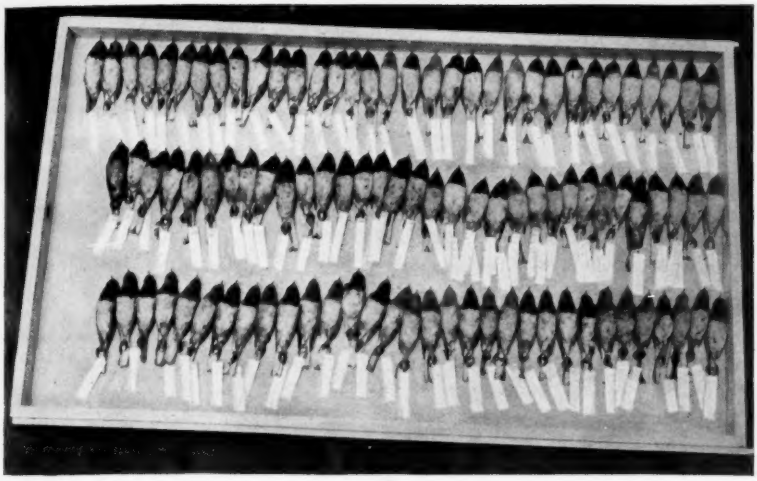
BY MARGARET W. WYTHE.

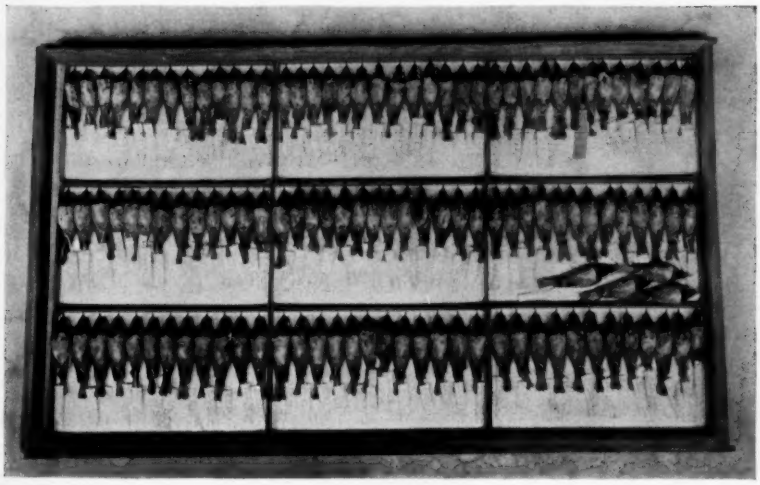
Plate XVII.

EFFORTS to insure permanent and safe preservation of materials and at the same time to provide for the greatest facility of handling them are instinctive aims of a museum curator. To this end, members of the staff of the Museum of Vertebrate Zoology have been seeking to discover improved methods of caring for the research collections under their charge. As a result, several ideas have been incorporated into our methods of housing and caring for birds and birds' eggs which may prove helpful to curatorial workers elsewhere.

The first improvement pertains to small bird skins. All specimens of this nature are stored in trays with pulp-board bottoms within standard unit zinc cases. The skins are arranged in rows, from front to back, each skin with head at left and label extended over tail and feet, toward the right. With trays of the size in use here, 22⅝ by 39 by 1⅝ inches (inside dimensions), a single row of Hummingbirds averages 60 skins, while a row of Song Sparrows averages thirty skins. Three such rows of skins comfortably fill a tray, so that no label is obscured or placed at an angle in order to be completely visible. This item is important in housing a collection whose prime purpose is study of a skin together with all known data pertaining to it, for the label is an index to this information. This arrangement, however, has presented one obstacle to the best preservation of skins. Every time a tray is opened and closed, no matter how carefully it is done, each skin has a tendency to slip sideways. This not only leads to ruffling of feathers, but, sooner or later, to crowding of skins toward the back of the tray.

After careful study of various methods, the following scheme has been adopted. Each large tray is divided into nine equal compartments by means of shallow containers. These small trays are made of light-weight, white cardboard, covered on the outside with a neutral tone paper which extends over the sides for





UPPER.—TRAY WITHOUT SMALL CONTAINERS.
LOWER.—WITH CONTAINERS, AND SHOWING TEMPORARY STORAGE OF NEW, ADDITIONAL SPECIMENS.

DMI. OF MICH.

their full depth. Our trays measure 7½ by 13 inches (outside dimensions) with sides ¾ inch high. These containers thus fit so closely that they will not move when a large tray is pulled out or pushed in. Exactness of fit is essential, so that in making out specifications for construction, *outside dimensions* are stated, and the utmost accuracy should be insisted upon when accepting the finished product.

It has been our experience that unless these containers are used at once, they usually need to be repacked for storage in order to keep them from warping. The method we have adopted is to lay double rows, bottom to bottom, inside of our surplus case trays. If these are not available, the small containers can be stacked with safety if sufficiently heavy cardboard a little larger than the tray or groups of trays be inserted between rows. In this case, care must be taken not to stack them too high, for the lower trays will have their sides crushed by the weight of those above. Warped containers are not good because the specimens do not stay in place well, and the trays themselves tend to tip instead of fitting snugly on all sides.

Containers of this size are useful for any specimens that fit large trays in three rows so that labels are entirely visible. Skins are arranged in the small containers exactly as in a large tray; that is, so that they are in three front-to-back rows, with heads at left. The only difference in appearance is that the rows are broken into three units each by the ends of the containers.

Advantages of this storage system are two-fold: (1) better permanent preservation of research study skins; (2) better facility for study purposes. Several factors for better preservation of specimens are apparent. In the first place, division of the large tray into a number of smaller units lessens the jarring upon each row of specimens. The containers themselves get the initial impact when a tray is opened and closed, and the specimens, instead of all slowly shifting position and piling at one place at the far end, get only one-third the impact, are jarred less, and tend to stay in position better. This eliminates the ruffling of feathers consequent upon undue movement and piling which sometimes happens even with the best of care, under the former method of storage.

In permanent storage of bird skins in the Museum of Vertebrate Zoology, all specimens of the same species are kept together, with space at the end of each series of skins for a limited number of new entries. Sometimes this space becomes used up and there is no further room for expansion until new cases are available. In the interim, the small shallow trays offer a special convenience. When a new specimen is added it can be placed lengthwise in the container which has other specimens from the same or nearest geographical locality, this being in general our arrangement within each species. There is less likelihood of overlooking the proper placement of recently added specimens when expansion becomes possible. If a large series has to be added, in the case of the smaller birds, a second layer of several containers can be placed on top of the first layer and still not be too high to touch the large drawer above. This upper row may be laid either crosswise, or lengthwise if separated by a single sheet of cardboard to keep it from settling onto the skins below. In this way the capacity of a large tray can be doubled when necessity arises.

The process of shuffling skins when expanding into new cases is much easier with the small containers. Whole series of skins, from ten to twenty, according to the size of birds contained, can be lifted with a single movement and placed in their new position without disarrangement; or, if new skins have to be added, it is often possible to do this by the insertion of another container, and shuffling of but a comparatively few skins.

Comparing trays which have been arranged according to this new method, with others not yet changed, the effect of the new is much more pleasing to the eye than the old way. The edges of the small containers not only help the individual rows of birds to stay in alignment, with bills against sides of containers, but give an appearance of greater neatness through the symmetry produced by lines intersecting at right angles.

As intimated above, this method of housing small bird skins has some distinct advantages for the research student. The small containers prove of considerable convenience for removing portions of a large series requiring critical study. If the needed specimens are already in one or more containers, it is much easier just to lift these out bodily than it is to have to pick up each skin

and put it down elsewhere. Or, if individual skins are to be selected from various parts of a drawer, the small container makes a light, and easily carried receptacle for the chosen specimens. In various ways these containers are found useful in disposing of materials for special problems of study—systematic, geographical, plumage, economic, and so on.

It is possible to use similar containers of different dimensions for larger birds—those skins which lie in two rows in a tray. However, there is not so great a tendency for larger, heavier skins to be ruffled and jarred backward by the impact produced in sliding trays out and in. On the other hand, the various other advantages which are found useful for small birds are equally applicable to larger specimens.

A matter of considerable importance to the curator of a research collection is the knowledge of where every specimen is at all times. No specimen should be allowed to leave its appointed place without some means of checking its whereabouts. Besides the customary loan receipt for specimens sent to research students in other institutions, some kind of slip left in place of the removed specimen is of great help in keeping track of the particular skin during its absence, and in easily locating its proper placement upon its return. For this purpose our museum has had special withdrawal slips printed on bright colored cardboard, the bright color in a tray functioning quickly to catch the eye. The slips, made in two sizes, one for small, the other for larger specimens, bear the following legend, to be filled out by the person withdrawing the specimen.

UNIVERSITY OF CALIFORNIA—MUSEUM OF VERTEBRATE ZOOLOGY
SPECIMEN WITHDRAWN

No.....By.....Date.....

Upon return of a specimen the withdrawal slip is removed. If filled out in pencil, this can be erased and the slip used again, or, if preferred, it can be filled out in ink and destroyed upon return of the specimen. The ease with which the position of a returned specimen can be located has been found to reduce considerably both time and labor of reinstallation.

Another improvement in curatorial method recently put into effect here pertains to the installation of sets of birds' eggs. This museum long ago adopted the round, glass-topped boxes for birds' eggs. These are lined with a fine-fiber white cotton to a sufficient depth to give an easy pressure to the eggs when the cover is adjusted. The difficulty of fixing the cotton pad so that it appears even and equally smooth all around the edge has been overcome by the use of a circle of thin cardboard. This circle is cut out in the center, leaving a narrow ring only, varying according to the size of box used. The outer edge of the ring is about four millimeters smaller than the inner circumference of the box. The method of preparation is simple: a small amount of cotton, nearly sufficient for the required depth, is fluffed up and laid evenly on the bottom of the box; then a fairly thick layer of cotton somewhat larger than the cardboard ring is spread on a flat surface with ring on top. The cotton is folded over the outer edge of the ring, care being taken not to pull it too tight and yet to make the edge even and smooth all around. When this is done, the whole is lifted and, with the aid of small curved forceps, is placed in the box, the forceps being used to push the cotton smooth around the edge. The eggs are then placed on the cotton, with the more pointed ends towards the center, and are held in place by a very slight lifting of the cotton wherever necessary to keep them from slipping out of position. They are then ready for the cover. Before placing the cover permanently it has been found desirable to turn it upside down and gently hold it on top of the box to see if the cotton is of the right depth—with not too much nor too little pressure upon the eggs.

Museum of Vertebrate Zoology, University of California, Berkeley, California.

THE SOUTHWARD SHORE-BIRD FLIGHT ON THE NEW JERSEY COAST IN 1928.

BY CHARLES A. URNER.

THE southward shore-bird migration of 1928 as witnessed from various points along the coast of New Jersey was remarkable in the diversity of species represented, the duration of the flight and the changes in the numerical strength of several species recorded. The flight was made under very nearly normal conditions, for the federal law against shore-bird shooting was for the first time quite generally observed in this area. There was no tendency therefore for the birds to be driven along faster than they would move normally, and feeding conditions en route, because of plentiful rainfall and other factors, were such that there was no apparent necessity for the birds to depart until actuated by other normal migratory impulses.

It is, of course, risky to draw definite conclusions from observations of shore-bird movements over a relatively restricted area, since several factors may influence the number of individuals passing or stopping to feed, giving an appearance of increase or decrease which may not be in accordance with the facts. Weather conditions during the flight undoubtedly influence the numbers of several species of migrating shore-birds passing near enough to the coast (longitudinally and "altitudinally") to be observed; and feeding conditions influence the numbers tarrying upon the marshes and flats in any locality. It is possible also that the route of migration of some shore-birds is subject to considerable variation from year to year, as with the Black Tern (*Chlidonias nigra surinamensis*). To detect this variation would require a comparison of statistics of migrations far more extended than those here available. However, the data here assembled may at least offer a starting point for a more detailed study of shore-bird migration and numerical strength in later years.

The following records are in part from the writer's own observations and in part from the observations of others affiliated with the Linnaean Society of New York and the Delaware Valley Orni-

thological Club. Especial mention should be made of the contributions of J. S. Edwards of Montclair, Warren F. Eaton of Upper Montclair, John F. Kuerzi of New York, Lester L. Walsh of Ridgewood, N. J., R. Peterson of New York and Julian K. Potter of Camden, N. J., John T. Emlen, Jr., and William H. Yoder of Philadelphia.

The localities from which records were secured extend from the Newark Salt Marsh south to Cape May, though the great majority were between Newark and Brigantine Beach, a distance of about ninety-five miles. Shore-birding on the Newark Meadows was especially productive in 1928 because of the filling operations in progress and the excellent feeding conditions prevailing. This locality was covered on twenty-five dates from July 11 to September 29 and less frequently later in the season.

Proceeding south, the next locality worked was the Manasquan River Inlet where some nineteen trips were made. The Barnegat Inlet flats were covered eight times; the Barnegat Marshes between Barnegat and Manahawkin, eight times; the flats at New Inlet, south of Beach Haven about fifteen times and the Brigantine and Absecon Marshes sixteen times or more. There were also scattered trips to intermediate points south to Cape May.

The trips, not including a number of casual observations on scattered dates, were grouped approximately as follows: two in late June; twenty-two in July; twenty in August; thirty in September; twenty in October; eight in November; fourteen in December; eleven in January when we may consider that the migration ceased. They were chiefly on Wednesdays and week ends and there were no extended gaps in the line of dates. Numbers of each species seen on each date and in each locality were recorded as exactly as possible.

It was found that the high point in total individuals of all species collectively occurred in the period July 21 to August 10, while the greatest number of species recorded was in September. The following table shows the numerical rise and fall of the movement:

TABLE I

Period	No. of species seen	Av'g. No. per trip	Totals of individuals
July 1–20	19	299	3.892
July 21–Aug. 10	18	2.005	27.877
Aug. 11–31	26	380	7.974
September	29	258	7.744
October	19	107	2.138
November	7	20	162
Later	10	25	615

The total number of species recorded positively was thirty-one and there were three other probabilities not included because not definitely or conclusively established. This total does not include the Woodcock which was of course present in suitable cover along the edges of the coastal marshes.

In many species it was noted that the season's flight occurred in definite waves, sometimes widely separated. There frequently was a large main movement and either earlier smaller flights or later recurrences on a smaller scale, due possibly to differences in time when the birds left the same breeding ground, differences in dates of leaving different breeding grounds or the filtering south from favorite feeding places along the line of flight as the urge to continue the migration was re-created by changing weather conditions, etc. In a number of species observed from the seashore the main flights coincided with a steady south breeze, but they were not always so associated, and considerable movements of several species were observed when the wind was very light from west or south.

The figures of numbers of each species seen (total of all trips) are not of course a true index of the relative numbers of each that were passing, since large flocks remaining to feed are counted several times and species rarely stopping over thus suffer in the comparison.

I have attempted to rank the strength of the thirty-one species listed by taking an average of (1) their ranking in "number of times seen"; (2) their ranking in "largest numbers seen in one day" and (3) their ranking in "total number seen on all trips."

These data, with the ranking of each species according to the above average, are given in Table II.

TABLE II.—RANKING OF SHORE-BIRDS ON JERSEY COAST AND SALT MARSH IN 1928. FALL FLIGHT.

	Rank	Times seen	Largest No. in 1 day	Total No. all trips
Semipalmated Sandpiper	1	67	6,000	30,774
Sanderling	2	54	500	3,651
Lesser Yellow-legs	3	52	450	3,707
Semipalmated Plover	4	56	300	2,343
Least Sandpiper	5	47	500	1,579
Black-bellied Plover	6	62	150	1,504
Dowitcher	7	38	325	1,624
Greater Yellow-legs	8	49	175	804
Killdeer	9	61	100	628
Red-backed Sandpiper	10	23	155	721
Hudsonian Curlew	11	20	166	605
Turnstone	12	45	75	598
Knot	13	23	150	465
Pectoral Sandpiper	14	42	75	535
Spotted Sandpiper	15	44	12	152
Golden Plover	16	10	93	134
Willet	17	15	30	142
Piping Plover	18	20	20	113
White-rumped Sandpiper	19	16	25	87
Upland Plover	20	8	13	48
Northern Phalarope	21	2	50	51
Stilt Sandpiper	22	6	14	31
Western Sandpiper	23	12	10	29
Wilson's Snipe	24	8	5	16
Purple Sandpiper	25	1	20	20
Marbled Godwit	26	5	3	11
Buff-breasted Sandpiper	27	3	6	8
Hudsonian Godwit	28	4	2	8
Baird's Sandpiper	29	5	2	6
Solitary Sandpiper	30	4	1	4
Red Phalarope	31	1	4	4

A study of this table will reveal some apparent misplacements under the system used. However, it should be remembered that the records are for the open salt marsh and seashore only. This explains the absence of the Woodcock and the poor showing of Wilson's Snipe and Solitary Sandpiper, both of which I have always found uncommon and rare respectively on salt marsh and sea shore. The basis of the ranking of each species is seen from the records in columns 3, 4 and 5 of the table.

There can be no disputing the right of the Semipalmated Sandpiper to first place. Of total counts of all species of over 50,000 individuals (some repetitions included) the number of Semipalmated exceeded 30,000 or about 61%. From this total it is a long drop to the group of Sanderling, Lesser Yellow-legs and Semipalmated Plover, which during the season under review were on approximately equal terms. The combined total of these three species falls a little short of 10,000 or slightly less than 20% of the whole. The next group in numerical strength includes Least Sandpiper, Black-bellied Plover and Dowitcher, which were approximately equal in numbers and totaled a little more than 4,500 or about 9% of the whole. The Greater Yellow-legs comes next, in an intermediate class, comprising a little more than 1½% of all birds seen. There is next a group of six species with fairly uniform totals—Killdeer, Red-backed Sandpiper, Hudsonian Curlew, Turnstone, Knot and Pectoral Sandpiper. The combined total of these six is a little over 3,000 or about 6½% of the whole. The remaining species taper off, comprising altogether less than 2% of the total number seen.

The movement of each species by three week periods up to September 1 and by monthly periods thereafter as indicated by average numbers seen per trip within these periods is shown in table III.

The duration of the southbound flight extended from June 27, when Least Sandpipers were first reported, to January 13 when six species (Knot, Semipalmated Sandpiper, Sanderling, Red-backed Sandpiper, Black-bellied Plover and Turnstone) were recorded, a span of six months and seventeen days.

Nature of the Localities Covered.

The localities visited with more or less regularity comprised all types of coastal country touched by salt water with which shore birds are usually associated.

Newark Meadows—This is an area about seven miles from Manhattan Island. It is shaped like a half moon, bordering Newark Bay for about five miles and having a maximum width of about two and a half miles. At low tide a great expanse of the muddy bottom of the bay is uncovered. Part of the meadow

TABLE III.—AVERAGE NUMBER OF EACH SPECIES SEEN PER TRIP. BY PERIODS.

	July 1–20	July 21–Aug. 10	Aug. 11 to 31	Sept.	Oct.	Nov.	Later
Red Phalarope						.5	
Northern Phalarope			.1	1.7			
Wilson's Snipe			.1	.2	.4	.1	.1
Dowitcher	28.	67.4	5.2	6.8	.2		
Stilt Sandpiper	.2		.2	.8			
Knot	11.5	5.7	2.5	5.1	.4		.1
Purple Sandpiper							.8
Pectoral Sandpiper	.3	1.1	5.7	11.4	2.7		
White-rumped Sandpiper			.8	2.2	.2		
Baird's Sandpiper				.2			
Least Sandpiper	86.5	4.9	10.1	5.3	.2		
Red-backed Sandpiper	.2		.1	1.1	8.2	8.5	18.1
Semipalmated Sandpiper	83.5	1,655.7	187.4	77.3	12.6		.1
Western Sandpiper		.4	.2	.6	.1		
Sanderling	4.2	72.5	44.	37.1	21.1	3.5	3.8
Marbled Godwit			.3	.2			
Hudsonian Godwit			.1	.1	.1		
Buff-breasted Sandpiper				.3			
Greater Yellow-legs	.6	5.4	18.3	10.9	.4	.1	.1
Lesser Yellow-legs	58.3	102.6	38.3	23.4	.3		
Solitary Sandpiper	.1		.1	.1			
Willet		.1	2.3	3.	.1		
Upland Plover	.1	1.1	1.3	.2			
Spotted Sandpiper	3.7	2.	1.4	1.1			
Hudsonian Curlew	15.1	21.2	7.	2.1			
Black-bellied Plover	.2	3.	7.2	12.8	42.6	5.1	.9
Golden Plover			.1	4.3	.2		
Killdeer	3.	2.8	2.1	13.1	3.9	2.4	.7
Semipalmated Plover	.5	43.1	33.2	27.8	12.7		
Piping Plover	3.3	2.	1.7	.8			
Ruddy Turnstone	.3	13.6	10.4	8.4	.8		.1
Totals	299.6	2,004.6	380.2	258.4	107.2	20.2	24.8

Amounts less than .1 included as .1.

is being filled in by the usual "Sand-sucker" hydraulic method, and shore-birds which prefer muddy shallows found feeding conditions ideal during the entire summer and fall of 1928. On the areas already filled were several shallow fresh water rain ponds and about these large numbers of species preferring or requiring some fresh water would congregate. Newark Bay is approximately twelve miles west of the line of the New Jersey shore, but it was, in 1928, visited by a considerable variety of species associated with the coastal beaches and sand bars and previously rarely recorded there, notably Sanderling and Turn-

stone. This might indicate a larger, broader flight of these species with a wider fringe, for while feeding conditions on Newark Meadows were unusually excellent in 1928, they were previously good and at times especially so.

Manasquan "Inlet"—The natural outlet of the Manasquan River, just north of Barnegat Bay is now closed. But it is in the path of a large flight of shore birds which either passes at sea near enough to be observed from shore, or follows a line just inside the beach over the coastal marshes and ponds. I have noticed that the flight over the "inshore" route followed by such birds as the Dowitcher, Least Sandpiper and Hudsonian Curlew, is more frequently used when there is a strong south wind or southerly storm, while the ocean route is the more popular in clear, calmer weather. But this is more a tendency than the rule. Incidentally I believe that during periods of favorable weather and light winds the main flight of such birds as Curlew, Turnstone, Black-bellied Plover and Knot passes so far off shore as to skip entirely that portion of the New Jersey coast with which I am familiar. This is indicated, at least so far as three of the above are concerned, by Mr. Kuerzi's counts at Cobb's Island, Va., (Auk, Vol. XLX, No. 1).

Barnegat Inlet—The region known as "North Point Flats" across the inlet from Barnegat Light, is a reasonably productive locality for those species preferring coastal sand flats, and yields a fair number of other species.

Barnegat Marshes—A great expanse of virgin and well-watered salt marsh lies between Barnegat and Manahawkin, on the westerly side of Barnegat Bay. Its numerous ponds and creeks are usually too deep for waders, but as the meadows are mowed Pectoral Sandpipers and Lesser Yellow-legs congregate at times in numbers. And over the marsh during the flight there is, on days with fresh southerly winds, a heavy movement of such species as the Hudsonian Curlew, Dowitcher and Yellow-legs.

Beach Haven (New Inlet)—The south end of Long Beach, N. J., at the north end of which is Barnegat Light, has recently been improved as a feeding ground by sand flat formation, and it has been more generally used by shore-birds in spite of its great and growing popularity as a fishing resort. At times I have seen

large flocks of Dowitchers and other species feeding there unmolested, though a veritable cordon of fishermen lined the shore.

Sheepshead Meadow and Little Island Beach.—These localities the next most favorable shore-bird localities to the south, were unfortunately visited but once during the period under review because of their inaccessibility. Had they been covered regularly the counts of some species, notably Knot, Turnstone and Black-bellied Plover, would have been larger, for they are for such species even more attractive than the following localities:

Brigantine and Absecon Marshes.—This area, just north of Atlantic City, is today a very attractive place for shore-birds. Curlew stop to feed regularly on the Absecon Marshes, and the ponds on the marshes back of the Brigantine dunes are excellent for variety, especially in late summer. On the southerly half of the island are some fresh water shallow rain ponds which are very productive especially at high tide. The new golf course is also proving an attraction.

Of the country south of Atlantic City, probably superior to that described, for several species, I am not sufficiently familiar to comment.

It should be understood that were one to make an effort to cover in one day as many of the above localities as possible much larger collective daily totals could be rolled up. But it has appeared best to limit the totals seen to single localities since comparable data in later years are more readily accumulated. It, moreover, requires the use of a boat and considerable time to attempt to cover all the above localities in one day.

RECORDS FOR EACH SPECIES.

Phalaropus fulicarius. RED PHALAROPE.—Several birds reported as "in all probability the Red Phalarope," were seen off the New Jersey shore about opposite the mouth of the Manasquan River on November 27 by four representatives of American Museum of Natural History (Auk, Vol. XLVI, No. 1, p. 103).

Lobipes lobatus. NORTHERN PHALAROPE.—This species is of regular occurrence off the Barnegat shore, but is rarely seen from the beach. This explains the paucity of records—two—August 12 and September 15.

Philohela minor. WOODCOCK.—This species, not included in the previous compilation, was found in suitable cover, both in the sprouts along the south end of Newark Meadows and on the west side of Barnegat Bay.

Gallinago delicata. WILSON'S SNIPE.—Records fragmentary because the best fresh water meadows in the locality were not visited. On Newark Meadows extreme dates September 3 to December 2 with maximum numbers September 3 (4) and October 21 (5).

Limnodromus griseus griseus. DOWITCHER.—The increase in the recorded numbers of this species was among the notable features of the 1928 flight. The principal waves seen at Manasquan Inlet, were July 14 and 18. After the first wave many were found feeding in favorable localities for some time, but there was a period of relative scarcity and no important movement observed from August 12 to 20. A secondary flight started shortly after the latter date. The daily maxima on the first and second principal movements in each locality with dates, follow:

	1st movement		2nd movement	
	Max.	Date	Max.	Date
Newark Meadows	18	July 18	8	Aug. 29
Manasquan R.	187	" 14	3	Sept. 8
Barnegat Inlet	80	" 21	8	" 8
Beach Haven	325	" 29	8	Aug. 23
Brigantine	250	" 22	115	Sept. 2
Averages	172	July 21	28	Sept. 2

The extreme dates were June 29 to Oct. 12.

Limnodromus griseus scolopaceus. LONG-BILLED DOWITCHER.—I have not included this subspecies in the previous compilations, though a bird very probably of this form was observed among Dowitchers at Brigantine in the late summer. It was slightly larger with a longer bill and seemed slightly darker in color.

Micropalama himantopus. STILT SANDPIPER.—This species was rarer in 1928 than in 1927. Recorded for the year only from the Newark Meadows where three birds in breeding plumage were seen July 18. No other record until August 29 when the species reappeared and remained until September 30. Maximum 14 on September 9.

Calidris canutus. KNOT.—Had Little Island Beach been visited regularly I believe the Knot would have shown much better in the numerical counts. It was not recorded on the Newark Meadows but was regular at Barnegat Inlet, Beach Haven and Brigantine, being commonest at Beach Haven. There seem to have been two main movements with the maximum of the first 150 at Beach Haven on July 14 and of the second 75 on North Point flats September 8. Extreme dates June 29 to October 4 with three at Beach Haven January 13, 1929.

Arquatella maritima maritima. PURPLE SANDPIPER.—Only 1928 record twenty at Cape May, December 23. (Bird Lore, XXXI, No. 1, p. 33.)

Pisobia maculata. PECTORAL SANDPIPER.—Best localities Newark Meadows, Barnegat Marshes and Brigantine. Barnegat Marsh counts below 1927 but Newark Meadow counts higher. A small early wave, but principal flight September, some remaining into October. Principal localities maxima and dates: Newark Meadows, 75 September 12; Barnegat Marshes 50 August 25; Brigantine 50 September 15. Extreme dates July 15 to October 28.

Pisobia fuscicollis. WHITE-RUMPED SANDPIPER.—Slight increase in recent years. Observed in four localities; most records Newark Meadows and Brigantine. Two late summer flights. Newark Meadows maximum 14 on August 29 and Brigantine 12 September 2, being followed by reduced numbers, then a jump to 25 on Newark Meadows September 23. Extreme dates August 11 to October 14.

Pisobia bairdi. BAIRD'S SANDPIPER.—More frequently identified but still rare. Extreme dates September 1 to 29 with maximum 2 on September 1. Seen only on Newark Meadows and Brigantine.

Pisobia minutilla. LEAST SANDPIPER.—In favorable localities this species is increasing. Especially common on Newark Meadows. Two principal movements, the first the larger. Newark Meadows peaks July 18 (500) and August 29 (100). Extreme dates June 27 to October 13.

Pelidna alpina sakhalina. RED-BACKED SANDPIPER.—A scattered few in July and August. The principal movement started in late September and the peak of numbers seen was unusually late, probably because several large flocks spent the early winter on the Jersey shore due to mild weather. Judging from Newark Bay counts the main flight occurred between September 30 and November 4. High count in that locality, 23 on October 28. The largest number (155) was recorded at Beach Haven December 9; 100 were still there January 13 and 125 at Corson's Inlet on the same date. Extreme dates July 8 to January 13.

Ereunetes pusillus. SEMIPALMATED SANDPIPER.—By far the largest counts were on the Newark Meadows with Barnegat Inlet second. The species was generally distributed and is undoubtedly increasing. The main flight and occurrence fell between July 19 and August 11 after which a sharp drop in numbers occurred with some recurrence in late August and early September. On the Newark Meadows the peak was reached August 1 (6,000), the following low August 19 (15) and the late peak August 26 (300). Considering all sections by ten day periods we get the following total numbers seen, adding all trips:

July	1–10 = 1	Sept.	1–10 = 1,320
"	11–20 = 1,084	"	11–20 = 450
"	21–31 = 10,680	"	21–30 = 550
Aug.	1–10 = 12,500	Oct.	1–10 = 80
"	11–20 = 2,765	"	11–20 = 172
"	21–31 = 1,170	"	21–31 = 0

Extreme dates July 1 to October 14 with 2 on January 13, a most unusual date.

Ereunetes mauri. WESTERN SANDPIPER.—Difficulties of satisfactory field identification with many individuals reduce the number of records. The main flight, according to the figures at hand, passed in September with a positive maximum of 10 on September 16 and extreme dates July 22 to October 12. It has seemed to the writer that when mixed flocks of Semipalmated and Western Sandpipers are feeding in shallow ponds the Western favors deeper water—possibly an explanation of the development of the longer bill—or vice versa.

Crocethia alba. SANDERLING.—Not enough time was spent walking the beaches to get a perfect picture of the movements of the Sanderling. My figures indicate a large flight July 21–31 followed by a recession and then a large movement from August 11 to September 10. On the Newark Meadows, where the bird was previously rarely seen, nine were observed July 22, then a gap to August 15, after which it was present to October 28 with a maximum of 17 on September 3.

The daily maximum for the several localities and dates of the early and late movements follow:

	Early Movement		Late Movement	
	High	Date	High	Date
Newark Meadows	9	July 22	17	Sept. 3
Manasquan R	15	" 29	75	" 15
Barnegat Inlet	400	" 21	500	" 8
Beach Haven	500	" 29	200	Aug. 23
Brigantine	15	" 22	150	Sept. 16
Averages	188	July 25	188	Sept. 7

Extreme dates July 1 to January 13.

Limosa fedoa. MARBLED GODWIT.—This, locally, very rare species was first found by Mr. Edwards on the Newark Meadows August 22 and two were found there by Edwards and others August 29, 31 and September 1. The writer with Mr. J. M. Johnson enjoyed a close study of three birds on the fresh water pond near the Brigantine golf course September 2. They were feeding within a few feet of the car in which we sat, running about on the partly submerged sidewalks, and we had opportunity to observe their method of drinking, curving the lowered neck apparently enough to allow the water to run into the throat. We could also observe their ability to flex the tips of their long pink-based bills.

Limosa haemastica. HUDSONIAN GODWIT.—This bird, formerly so rare, was seen on four dates on the Newark Meadows as follows: August 31—2 (Ralph Friedman); September 29—2 (Warren F. Eaton); September 30—2 (Edwards & Urner); October 13—2 (Edwards & Clausen). It is probable, because of observed differences in relative size of the birds seen together, that these records represented at least six individuals.

Tryngites subruficollis. BUFF-BREASTED SANDPIPER.—There are three records for 1928. Flock of six seen by Mr. Potter at Brigantine September 9 (Auk Vol. XLVI, No. 1, p. 109). The same day Mr. Edwards found one on the Newark Meadows and the writer found one on Brigantine September 16. It will be noted that the Newark and Brigantine dates correspond, as they did with the appearance of the Marbled Godwit, indicating a definite scattered flight of both species along the Atlantic Coast.

Totanus melanoleucus. GREATER YELLOW-LEGS.—Larger numbers seen on the Newark Meadows than in any fall flight in my experience there, dating back intermittently to 1895. There was a scattered early movement from mid-July on, but a big jump August 29 to September 1 and then a sharp drop. Barnegat guides of my acquaintance reported a large flight over the Barnegat Marshes September 1–4. No record of numbers but hundreds of birds seen in scattered flocks passing south. The record by ten day periods (total numbers seen) for all localities, follows:

July	1–10 = 0	Sept.	1–10 = 243 +
"	11–20 = 8	"	11–20 = 52
"	21–31 = 24	"	21–30 = 32
Aug.	1–10 = 51	Oct.	1–10 = 0
"	11–20 = 131	"	11–20 = 7
"	21–31 = 253	"	21–31 = 1

The figure for September 1–10 does not include the unrecorded numbers, seen by guides, passing Barnegat September 1–4.

The extreme dates of occurrence are July 12 to December 6.

Totanus flavipes. LESSER YELLOW-LEGS.—This species is increasing as a summer bird on the Newark Meadows, but this is probably due, in part at least, to less favorable conditions elsewhere in the New York City region. Thus Hunts Point, in the Bronx, where many previously summered, has been destroyed as a feeding ground. Counts at Jersey shore points, other than the Newark Meadows, showed no great change in 1928. Of the other areas visited the bird is commonest on the Barnegat Marshes and Brigantine. There was evidence of several waves. On the Newark Meadows the first arrived early in July and there were a number of peaks with drops between, the dates of the high counts being July 12 (250); August 1 (450); August 29 (300); September 9 (175); September 23 (40). The most notable drop was August 22 (15), which divides the season into two principal movements, the first or July wave being the larger. Over the Barnegat marshes birds were passing south intermittently all day, on August 25, in small scattered flocks.

The record by ten day periods (total numbers seen) follows:

June	29 = 1	Sept.	1–10 = 529
July	1–10 = 20*	"	11–20 = 81
"	11–20 = 738	"	21–30 = 92
"	21–31 = 779	Oct.	1–10 = 0
Aug.	1–10 = 658	"	11–20 = 6
"	11–20 = 284	"	21–31 = 0
"	21–31 = 520		

Extreme dates June 29 to October 14.

Tringa solitaria solitaria. SOLITARY SANDPIPER.—So rare on salt coastal marshes that records have no significance. Extreme dates July 14 to September 23; day's maximum, one.

Catoptrophorus semipalmatus semipalmatus. WILLET.—I know of no recent near approach to the 1928 records for the localities visited. Several birds seen were migrating, flying south over the marshes west of Barnegat Bay. Recorded from six localities. The peak of numbers was reached September 1–10. Brigantine attracted the largest number, with 30 on August 9. On August 2, 10 were seen at Beach Haven and 27 at Brigantine—total for the day 37. Extreme dates August 5 to October 4.

Bartramia longicauda. UPLAND PLOVER.—In recent years regular in mid-summer on the dryer diked sections of the Newark Meadows. It was reported nowhere else in the region in 1928, though I have frequently heard it passing down the shore at night in late August. Maximum 13, August 22. Extreme dates July 11 to September 2.

Actitis macularia. SPOTTED SANDPIPER.—Since this bird breeds here, the migratory movement is not as easily recognized. The dates of principal flights are not ascertainable from the records. Last seen September 23.

Numenius hudsonicus. HUDSONIAN CURLEW.—The 1928 flight as seen from the New Jersey shore was more protracted than in 1927 and the single day maximum was lower. The reduced number actually seen compared with 1927 was probably without significance; the numbers passing the New Jersey shore probably maintain the increases of recent years. There was a considerable flight (166) seen from Manasquan Inlet July 18; a definite, steady but scattered flight was observed by guides over Barnegat Bay from August 1 to 7 with at least 150 on August 5; a full 100 were seen to pass Barnegat Marshes August 11. Numbers were observed at Brigantine feeding on the marshes (47 July 22 and 50 September 2). The species is rare on the Newark Meadows and evidently seldom wanders inland in this vicinity. Extreme dates were July 4 to September 16.

Squatarola squatarola. BLACK-BELLIED PLOVER.—There seem to have been two principal movements after a dribbling flight of July and

*This number would have been larger had the Newark Meadows been visited in this period.

early August. There was a definite increase in numbers in late August and early September, but probably the main 1928 southern flight occurred in early October. The species was very generally distributed though commonest inside the outer beaches at Barnegat Inlet, Beach Haven and neighboring flats, and the marshes south to Brigantine. The peak dates at the various localities follow:

	Peak	Date
Newark Meadows	40	Sept. 30
Manasquan Inlet	20	Oct. 14
Barnegat Inlet	200	Oct. 4
Beach Haven	150	Oct. 4
Brigantine	75	Aug. 26
Ludlom Beach	125	Oct. 14
Average	102	Sept. 29

It is probable that the main flight was missed at Brigantine and the Absecon meadows. Extreme dates were June 27 (possibly north bound) to January 13.

Pluvialis dominica dominica. GOLDEN PLOVER.—The Newark Meadows still stand preëminent as a resting and feeding grounds for the Golden Plover in this region. Its regular occurrence there, and rarity elsewhere indicate not only favorable food conditions, but the probability that this stretch of marsh has been an established stopping point with the species for centuries. Hunters still live in Elizabeth who recall the days when "Goldenbacks" were gathered here by the bushel basket for market. The 1928 flight established a new high record following the bad slump in numbers a few years back. The records were from August 31 to October 28 with a maximum of 93 on September 30.

Oxyechus vociferus. KILLDEER.—The fact that the bird breeds here masks the migratory movement somewhat. However the totals and averages indicate that the main flight in 1928 occurred during September, the high count being a flock of 100 at Cape May Court House September 30. The peak on the Newark Meadows was 35 September 5; at Manasquan 18 on November 10; on Barnegat Marshes 10 on August 11; at Brigantine 30 on September 16. There is no uniformity here, but the frequent Newark Meadows trips clearly indicated the principal flight in September. Possibly the species wintered this year for Walsh and Johnson found birds at Brigantine February 10.

Charadrius semipalmatus. SEMIPALMATED PLOVER.—This bird did not reach the high records of recent years. The ten day counts indicate a considerable movement, after a scattered early July start, from July 21 forward, with a slight recession in mid-August, but some large counts from August 21 to September 11, followed by another drop and a slight increase October 1–10. The peaks by localities, with dates follow:

	Peak	Date
Newark Meadows	150	July 28
Manasquan Inlet	50	Sept. 15
Barnegat Inlet	300	Sept. 8
Beach Haven	225	Oct. 3
Brigantine	200	Aug. 5
Average	189	Aug. 31

Extreme dates July 1 to October 28.

Charadrius melodus. PIPING PLOVER.—Counts not indicative of migration since the bird breeds. At Manasquan Inlet, where there are no breeding pairs, high counts were August 18–19 (15 on 18th). At Seaside Park 20 on July 15; at Brigantine 15 on September 9. Latest date September 15.

Arenaria interpres morinella. RUDDY TURNSTONE.—I was rather surprised that the numbers seen were not larger. However, the species was generally distributed and present with unusual frequency on the Newark Meadows, where it was formerly very rare. But there were no high counts. The high records by sections with dates follow:

	Peak	Date
Newark Meadows	7	Sept. 5
Manasquan Inlet	12	Sept. 15
Barnegat Inlet	75	July 11
Beach Haven	50	Aug. 5
Brigantine	45	Sept. 16

The averages per trip by three week and month periods in Table III indicate the principal movement to have been July 21 to August 31. The ten day total counts of individuals give a somewhat different picture:

June	29 = 0	Sept.	1–10 = 147
July	1–10 = 3	"	11–20 = 103
"	11–20 = 0	"	21–30 = 2
"	21–31 = 49	Oct.	1–10 = 7
Aug.	1–10 = 60	"	11–20 = 7
"	11–20 = 130	"	21–31 = 1
"	21–31 = 88		

Extreme dates were June 29 to October 24 and an unexpected single bird in good condition January 13.

Haematopus palliatus. OYSTERCATCHER.—While I have not included this bird in the tabulation earlier in this article, two individuals were reported seen near Barnegat Inlet late in the summer by Oscar T. Eayre of Barnegat, an exceptionally competent observer of water birds. He knows the birds as "Oyster-crackers."

Elizabeth, N. J.

PHOTOGRAPHING WILD TURKEY NESTS IN PENNSYLVANIA.

BY GEORGE MIKSCH SUTTON.

Plate XVIII.

DURING the spring of 1928, while studying the white-tailed deer population problem in the mountains of Pennsylvania I had the good fortune to be able to examine and photograph two nests of the Wild Turkey (*Meleagris gallopavo silvestris*), a species which, in its present somewhat hybrid form, is holding its own fairly well in the wilder mountains of the Commonwealth in spite of being hunted extensively nearly every fall.

One of these nests was on State Game Refuge No. 2, not far from Clearfield, Clearfield County. This nest was situated more or less in the open, and at no great distance from the steep mountain road which winds up the slope to the refuge keeper's house. When we first visited the nest the female slipped off quietly and ran away through the laurel and scrub oaks. She did not fly, and her departure was virtually noiseless. I waited near this nest, in a concealed spot, for over an hour, and had the pleasure of seeing the trim, long-legged creature slip back furtively to her eggs. I did not secure photographs of the bird as she settled upon the nest but I saw her coming through the woods at some distance, and made one or two exposures which present to the eye only a tangle of vines and bushes.

The nest held eight fresh eggs on May 5; the set was, no doubt, incomplete. (See Plate XVIII.) It was not sheltered from directly above, so the eggs were visible at some distance; but when the female was on the nest it was virtually impossible to see her, so perfectly did her colors harmonize with her surroundings.

On June 6, on a rocky mountainside about twelve miles from Lock Haven, Clinton County, I examined a nest which held seventeen well incubated eggs. On the day before there had been eighteen eggs; it is thought that a skunk or fox had disturbed the nest, though the female bird evidently had been sitting closely most of the time. This nest was built among small, angular

UPPER.—WILD TURKEY HEN ON NEST.
LOWER.—NEST AND EGGS.

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rocks, and, while not very well hidden from above, it was screened on all sides by thick laurel, which made photography difficult. The female bird was either very unsuspicious or remarkably brave, for she did not leave her nest while we were near. Her broad back, with its squamate pattern and dull greenish lights, was difficult to discern among the foliage and the intricate interlacing of shadows. When first seen her neck was stretched out at full length in front of her, and her plumage was spread and flattened out noticeably. When she realized she was being observed she drew her head back and moved it slowly about in a snakelike manner, while she gave forth strange hissing and grunting sounds. When she had become accustomed to us she again stretched her neck out in front of her. Occasionally, when disturbed, she gave a characteristic *quit, quit.*

Near this nest had been found, a short time before, two other Wild Turkey nests, both with large sets of eggs. The incubating female of one of these nests had been killed on the nest and eaten nearby. A trap set immediately near the broken eggs held, on the following morning, a female Gray Fox, which a day later, while in captivity, gave birth to two cubs. The other nest was deserted after a Skunk had eaten most of the eggs.

The average Wild Turkey taken nowadays in Pennsylvania has the rich colors, chestnut-tipped tail, and red legs of the form which originally occurred in this region. Nevertheless birds with white-tipped tails are not infrequently taken, and many specimens whose primaries are partly black and white barred, and partly solid slaty black, have been examined. Upon investigating the history of the State Game Commission's restocking of this species, I find that but very few birds have been brought into Pennsylvania for restocking *directly* from other regions.[1] Most of the birds were purchased from breeders living in Pennsylvania and care was used in selecting the wildest possible stock from the birds on hand. The source of the stock held by these Pennsylvania breeders is largely a matter of conjecture: some birds had been purchased from Vermont, and the status of the Vermont stock was, at the time of purchasing, unknown; others were probably from Virginia and

[1] See The Turkey in Pennsylvania, 'The Cardinal,' II, No. 5, January, 1929, p. 109.

Maryland. A total of 1,985 Turkeys have been liberated by the Commission since this work began in 1913; by far the greater part of these were actually Pennsylvania stock or birds which had interbred considerably with native Pennsylvania stock.

Most of the hybrid characters now found in our birds, therefore, have resulted not from the introduction of stock by the Game Commission, but from the inevitable mingling of the wild birds with domestic stock on the farms. The domestic bird's roving instinct takes it to the forests; its call-notes summon the wild mate which sometimes actually comes to the farmyard, and thus has our race been merged with stock whose original habitat was probably Mexico.

Game Commission, Harrisburg, Pa.

APRIL BIRDS OF THE CAMARGUE.

BY FRANCIS HARPER.

Plate XIX.

FOR zoölogists, one of the most interesting phases of life in the A. E. F. was scraping acquaintance with a new fauna. This was particularly true after the signing of the armistice, when one's attention was not so exclusively concentrated on military duties, and leaves for traveling were occasionally obtainable.

In January, 1919, Lieut. Ludlow Griscom wrote me such a glowing account of a trip he had just made to the Camargue, that I naturally headed in the same direction when a leave was granted me in April.

This desolate, marshy country about the mouth of the Rhone may be fairly considered the 'birdiest' area in France. The richness of its avifauna was made known long ago by Crespon (1840; 1844), Von Müller (1856), and Jaubert and Lapommeraye (1859). The publications of more modern students, beginning with Eagle Clarke (1895; 1898), are listed in the appended bibliography. This includes the more important papers (as far as they have come to my notice) that deal in a general way with the bird life of the Camargue or closely adjoining areas; also certain shorter articles on one or several species of particular interest. The bibliography is presented in the hope that it will prove useful to those who may undertake further investigations in the region. My own list of identified species was limited by lack of previous acquaintance with many of the birds that occur in the Camargue. However, since few of the other writers have dealt particularly with the birds present in April, the migration dates as well as the notes on habits in the following account may be of some interest.

On Griscom's recommendation, I decided to make my headquarters at Les Saintes Maries de la Mer, a little village on the Mediterranean littoral, and the terminus of a narrow-gauge railroad from Arles. An enforced stop at the latter city during the afternoon of April 8 yielded only a few birds, but it enabled me to see the Roman amphitheater and the Roman theater—

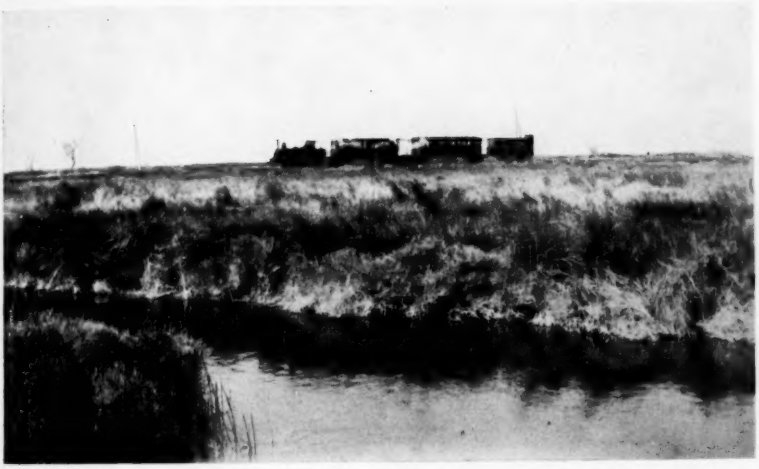
striking monuments of the early Christian era—and also the Museon Arlaten. Among the treasures of the latter, I recall a photograph of Flamingo nests and a letter from President Roosevelt to Frédéric Mistral. A statue of this noted Provençal poet, who drew an intimate picture of wild nature as well as of human nature in the Camargue and thereabouts, adorns the Place du Forum and is looked upon with reasonable pride by his compatriots.

Early the next morning (April 9) I set out on a railroad journey of two and a half hours to Les Saintes Maries, a distance of 40 kilometers. The country is very level, and is given over largely to the cultivation of the vine and other crops. As the train approaches the coast, however, after passing the intermediate stations of Signoret, Albaron, Les Bruns, Balarin, Pioch-Badet, Icard, and Maguelonne, most of the cultivated districts are left behind, and wide marshes and wastes, interspersed with ponds and sloughs, extend to a treeless horizon.

Certain portions of the marshes, especially in the vicinity of various sloughs and ditches, are occupied by beds of reeds, and are too wet for comfortable walking. The reeds look much like that familiar cosmopolitan species, *Phragmites communis*, but I am not sure of their identity. There are also extensive areas where the ground is rather dry, and where the most abundant and characteristic plant is glasswort (*Salicornia*). Walking is fairly easy over these 'wastes,' as Eagle Clarke calls them. Here and there on the drier ground are straggling tamarisk bushes, or even small trees.

Close to Les Saintes Maries there are numerous shallow ponds, up to a mile or so in diameter. Near their borders are certain patches of ground sufficiently elevated and dry to be cultivated, and here the villagers tend various small crops. A couple of good roads are built upon causeways through the marshes, and there are also some indifferent cart-paths. The banks of drainage ditches through the marshes afford the pedestrian another convenient means of getting about.

In April, at least, there seems to be, as the inhabitants say, 'toujours un grand vent'—doubtless the *mistral*. An almost constant wind, often brisk or strong, with an unobstructed sweep over the marshes, certainly was enough to mar one's enjoyment of



SCENES ABOUT LES SAINTES MARIES, BOUCHES-DU-RHÔNE, FRANCE.
UPPER.—THE VILLAGE. MIDDLE.—A CHANNEL THROUGH THE MARSHES.
LOWER.—SHALLOW POND (ETANG), MUD-FLAT AND GLASSWORT 'WASTE.'

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bird-gazing. In spite of the wind, there seemed to be a very small surf on the Mediterranean shore. Incidentally, there was a marked scarcity of birds on or over the sea.

The notorious Camargue mosquitoes were already troublesome by the time of my arrival, on April 9. In a few more days sand-flies of some sort became annoying, and wood ticks, crawling up my legs, reminded me of those on Gardiner's Island, N. Y.

The following notes were obtained on daily excursions from April 8 to 17. Unless some other locality is specifically mentioned, all records refer to the immediate environs of Les Saintes Maries, within a radius of a couple of miles.

The sequence of species is that of Hartert's 'Die Vögel der Paläarktischen Fauna' (1903–23). The French names of birds, which are given after their English names, have been compiled from various texts.

The specimens collected were deposited in the United States National Museum.

1. **Corvus corone corone** L. CARRION CROW; CORNEILLE NOIRE.—Several seen near Les Saintes Maries almost every day from April 10 to 16, and near Balarin, April 9 and 16.

2. **Pica pica pica** (L.). MAGPIE; PIE ORDINAIRE.—Only a few seen near Les Saintes Maries, April 11 to 14, doubtless on account of the scarcity of trees in this vicinity. Much commoner in the better wooded country between Arles and Icard, April 9 and 16.

3. **Carduelis carduelis carduelis** (L.). CONTINENTAL GOLDFINCH; CHARDONNERET ÉLÉGANT.—Several were seen among the few shade trees along the streets of the village, April 10 to 16. Here, as elsewhere in France, it seems to be a favorite cage-bird. One kept at the hotel was a frequent singer.

4. **Passer domesticus domesticus** (L.). HOUSE SPARROW; MOINEAU DOMESTIQUE.—Common about the village of Les Saintes Maries, April 10 to 15, and at Arles, April 17.

5. **Emberiza calandra calandra** L. CORN BUNTING; BRUANT PROYER.—Noted in small numbers near Les Saintes Maries daily, April 11 to 16; also between Pioch and Signoret, April 9 and 16. This is a bird of the open country, such as grassy fields and meadows. It suggests our own Savannah Sparrow (*Passerculus sandwichensis savanna*) in its choice of habitat as well as in its appearance. Its song is much like that of the Grasshopper Sparrow (*Ammodramus savannarum australis*), but not quite so insignificant. For a singing perch it seeks a telephone wire, a fence, or a bush.

6. **Emberiza tschusii compilator** Mathews and Iredale. WESTERN LARGE-BILLED REED BUNTING; BRUANT DE MARAIS.—Small numbers of this species were observed daily, April 11 to 16. The black-headed males were very conspicuous, but females were scarcely in evidence. The bird seems to find its proper home in the extensive beds of reeds, but often resorts to a small tree or bush on a slightly elevated part of the marsh for the purpose of singing. Its calls are of two sorts: a clear, almost whistled *tyee*, and a harsher *jhee-jhee*. Its not unpleasing little song is very slightly suggestive of the Song Sparrow's (*Melospiza melodia melodia*): *jhee, jhee, jhee, twee-twee-twee-t-t-t-t-twee*. There is a little rasp in the song as well as in the double call-note.

Two males were collected, April 11 and 12.

7. **Galerida cristata cristata** (L.). CRESTED LARK; COCHEVIS HUPPÉ.—A few of these interesting Larks were found near Les Saintes Maries, April 10 to 16. They frequented some slightly elevated patches of cultivated ground beside one of the larger ponds. One was observed singing at a general height of about 400 feet for a period of six minutes; it was there both when first noticed and when lost sight of. Meanwhile, facing the breeze, it kept its wings moving. It did not seem to sing quite continuously, as is the Skylark's habit. Interspersed in its song were notes somewhat resembling its clear, spirited call, *kee-tee-doo*, and easily heard at a distance of several hundred yards.

8. **Alauda arvensis arvensis** L. SKYLARK; ALOUETTE DES CHAMPS.—The Skylark was found very commonly on the drier areas, from April 9 to 16. The birds were in full song at this season, and were continually mounting in the air to pour out their exuberant melodies. A specimen was collected on April 13.

On one occasion I met with two youngsters who were setting out small wire spring-traps for such birds as Larks on some open ground near the village. They were baiting the traps with live and wriggling insect larvae.

9. **Motacilla flava flava** L. BLUE-HEADED WAGTAIL; BERGERONNETTE PRINTANIÈRE.—This beautiful Wagtail was one of the most characteristic birds of the Camargue marshes in April. Near Les Saintes Maries it was observed in numbers practically every day from the 9th to the 16th, and on the last-mentioned date one was noticed at Pioch. It makes a striking figure as it sits atop the low marsh vegetation and utters its quaint and distinctive *weezip*, or *zzeeip*. This note is also given during its undulating flight. The species was generally noted singly, but sometimes in an association of two or three individuals. It feeds on the ground, but spends considerable time in maintaining a wary lookout from the top of some marsh plant, and is very difficult of approach. A male was collected on April 14.

10. **Motacilla alba alba** L. WHITE WAGTAIL; HOCHEQUEUE GRISE.—On April 8 one was seen flying about the old Roman amphitheatre at

Arles, alighting on the upper part, and then going down into the arena itself. With its trim, martial aspect, enhanced by its mincing steps, and by its black crown and jugulum suggesting helmet and shield, respectively, the presence of this bird seemed peculiarly in keeping with the atmosphere of the place. Even its gray coat harmonized with the ancient stones of the structure.

11. **Parus major major** L. CONTINENTAL GREAT TIT; MÉSANGE CHARBONNIÈRE.—Two seen at Balarin on April 9.

12. **Lanius senator senator** L. WOODCHAT SHRIKE; PIE-GRIÈCHE ROUSSE.—A tailless individual seen in the shrubbery on the dunes along the sea-front, April 16.

13. **Phylloscopus trochilus trochilus** (L.). WILLOW WARBLER; POUILLOT FITIS.—Small numbers of *Phylloscopus* were noted commonly from April 9 to 16. They appeared for the most part in small bands of two or three to seven or eight individuals, as if migrating, and were quite silent. Though sometimes seen in the wastes grown with *Salicornia*, they frequented more particularly the straggling tamarisk bushes on the slightly elevated and drier areas. They were perhaps the least shy of the excessively wary Camargue birds, sometimes allowing an approach to within 20 feet or so. The four specimens collected are referable to the above-mentioned form.

14. **Sylvia conspicillata conspicillata** Temminck. SPECTACLED WARBLER; BABILLARDE A LUNETTES.—This little bird of elegant plumage seems a characteristic species of the Camargue wastes. Its particular haunt is among the glasswort (*Salicornia*) that forms a thick, low growth over wide areas. Now and then it appears on the top of this vegetation, watching one's approach with a wary, bespectacled eye, and perhaps giving a rolling little chatter. It was observed in rather small numbers from April 9 to 13, and two males were collected.

15. **Cisticola juncidis juncidis** (Rafinesque). FANTAIL WARBLER; BEC-FIN CISTICOLE.—This sprite finds a congenial home in the extensive beds of reeds in the marshes about Les Saintes Maries, and was noted commonly and daily from April 11 to 16. It frequently mounts into the air to a height of 50 or 75 feet above the reeds, where it maintains a rather aimless, undulatory flight for a period varying from half a minute to several minutes; meanwhile, as it exerts its wings at the commencement of each upward movement, it simultaneously gives voice to a very sharp and rather grating *dzeep*. If this be a love song, it is about the simplest and poorest attempt imaginable, relieved only by the accompanying flight maneuvers. The bird seems to be extraordinarily and unaccountably wild; it does not skulk in the reeds like a Sedge Warbler (*Acrocephalus schoenobaenus*), but at the first sign of an intruder is awing and away, often to a distant spot.

16. **Turdus merula merula** L. BLACKBIRD; MERLE NOIR.—On April 15, during a strong westerly wind, a Blackbird was seen along the shore causeway, far from any suitable haunt for it.

17. **Oenanthe oenanthe oenanthe** (L.). WHEATEAR; TRAQUET MOTTEUX.—On April 9 a little band of three individuals gave me an opportunity to become acquainted with this decidedly interesting species. I found them along the causeway that extends eastward from Les Saintes Maries, bordering the desolate coast. They fed over the ground, but now and then assumed a perch on a bush or a post. In flight the white area at the base of the tail, set off by the black wings, makes a very striking field mark; but at the moment of alighting it is blotted out by the folded wings. Thus the Wheatear, in suddenly transforming its 'high visibility' into 'low visibility' at this often important moment, suggests the more or less analogous cases of such diverse forms as the Mockingbird (*Mimus*), the Meadowlark (*Sturnella*), and the Cottontail Rabbit (*Sylvilagus*).

When on the ground, watching one's approach, a Wheatear will express its nervousness by making as quick a bow as perhaps any bird is capable of. It seems almost to throw itself, with a wing-flirt, on its face, but on the instant it has recovered an upright position again. The eye can scarcely follow the movement, it is accomplished with such lightning speed. I did not hear a note from this species.

Two males were collected on April 9, and on several other days (April 13, 14, and 16) single individuals were observed in the vicinity.

18. **Saxicola rubetra rubetra** (L.). WHINCHAT; TARIER ORDINAIRE.—On April 13 and 14 I observed a small number of these handsome little birds, for the most part in a loose aggregation of three or four individuals. They were apparently on migration, and silent. They fed on the ground, and perched on bushes and other low plants, as well as on the roadside telephone wires. Two specimens were collected.

19. **Saxicola torquata rubicola** (L.). STONECHAT; TARIER RUBICOLE.—One was seen from the train near Pioch, April 16.

20. **Phoenicurus phoenicurus phoenicurus** (L.). REDSTART; ROUGE-QUEUE DE MURAILLE.—From one to three Redstarts were seen nearly every day between April 9 and 16. They frequented the drier and more elevated areas, where there is a straggling growth of tamarisk and other bushes. As a bird spreads its wings in flight, it displays the rufous on its rump and tail, and the flash of color catches one's eye. On alighting in a bush, it indulges in a convulsive quivering of its tail. The only note I heard from the species here was a clear, almost whistled, *wheet*. Two males were collected.

21. **Luscinia svecica** subsp. BLUETHROAT; GORGE-BLEUE.—On April 13 I caught a glimpse of a Bluethroat in a bushy part of the marshes.

22. **Hirundo rustica rustica** L. SWALLOW; HIRONDELLE DE CHEMINÉE.—Several were observed on April 8 at Arles, and others on the following day during the railway journey to Les Saintes Maries. Here numbers were in evidence daily throughout my stay. They seemed to make their headquarters about the walls of the historic old church in the village. One was noted at Arles again on April 17.

23. **Apus apus apus** (L.). SWIFT; MARTINET NOIR.—One appeared flying above Arles on April 8.

24. **Upupa epops epops** L. HOOPOE; HUPPE VULGAIRE.—A day afield becomes particularly memorable when it includes a glimpse of a bird with the bizarre and handsome plumage, the curious form, and the generally exotic air of the Hoopoe. This bird was a fairly familiar sight during my walks about Les Saintes Maries, and was also seen from the train between this point and Pioch, April 9 and 16. One might naturally assume that the birds were simply migrating through this region en route from their winter home in Africa, and that they would not attempt to nest in the lower part of the delta, owing to the lack of sufficiently large trees. Eagle Clarke (1895, p. 195), however, found Hoopoes "surprisingly abundant throughout the Camargue" in May, and "brooding in holes at the roots of small trees" in localities where "there was an entire absence of the usual nesting-sites selected by this species."

The birds were generally flushed while feeding over the ground among the sparse shrubbery along the roadsides or in other slightly elevated places, and they sometimes alighted in small trees. The white-barred wings and the golden-buff head make the species a very striking figure in flight. Most of the birds were observed singly, but a few were in loose bands of as many as three or four individuals. They were apparently silent at this season.

25. **Jynx torquilla torquilla** L. WRYNECK; TORCOL ORDINAIRE.—This odd bird was encountered on April 9, when I obtained glimpses of two individuals in some shrubbery.

26. **Falco tinnunculus tinnunculus** L. KESTREL; FAUCON CRESSERELLE.—One or two Kestrels, presumably of this species, were seen over the marshes nearly every day from April 11 to 16.

27. **Circus aeruginosus aeruginosus** (L.). MARSH HARRIER; BUSARD DES MARAIS.—It was gratifying to find this large harrier, now almost gone from England, a comparatively common bird of the Camargue. Nearly every day (April 9 to 16) numbers were seen as they beat over the wide marshes, flapping for the most part but occasionally indulging in a short sail. Once I observed one turning somersaults in the air, this doubtless being a courtship performance similar to that of the American Marsh Hawk (*Circus hudsonius*).

28. **Accipter nisus nisus** (L.). SPARROW HAWK; ÉPERVIER ORDINAIRE.—A single bird seen on April 16.

29. **Ardea purpurea purpurea** L. PURPLE HERON; HÉRON POURPRÉ.—Several Herons, seen from the train near Pioch, April 9, and at Maguelonne, April 16, were probably of this species rather than *Ardea cinerea cinerea* L. At a distance some of them appeared dark bluish, and only a little larger than the next species.

30. **Egretta garzetta garzetta** (L.). LITTLE EGRET; AIGRETTE GARZETTE.—A flock of 16 Little Egrets was found at the borders of a small pond in the marshes on April 15. When flushed by the sound of a

distant shot, they hovered over the pond for a couple of minutes, facing a strong breeze, and remaining for the most part in a fairly compact body. After alighting, they took wing once or twice more, as they were startled by Ducks rising from the pond.

31. **Phoenicopterus ruber antiquorum** Temminck. FLAMINGO; FLAMANT ROSE.—An ornithological pilgrimage to the Camargue is scarcely fulfilled unless it includes a sight of these famous birds. This is apparently the only part of France where they nest and can be found with any sort of regularity. I was informed that they nest in the month of June on the wide and shallow Étang de Valcarès; and a photograph of a group of their mud-formed structures on this lagoon may be seen in the Museon Arlaten. Incidentally, some of the more recent of the Continental ornithological texts still maintain that the incubating bird straddles the nest (*couver à cheval sur son nid*).

On the morning of April 13, while I was approaching one of the large ponds nearest to Les Saintes Maries, I suddenly became aware of a long line of very tall-looking, faintly rose-colored birds strung out in the shallows near the opposite side. Most of them, engaged in feeding, had their long necks stretched to the water; but a few were alert, with heads erect. Just then the flock took to the air with a gorgeous display of scarlet and sable pinions, and circled about and back and forth for several minutes. They were in a fairly compact body, roughly circular in outline, and apparently several strata deep. There was a noticeable unison in their movements. They remained at a rather low height, say 25 to 75 feet. Meanwhile their confused chorus of goose-like honks carried quite plainly over a distance of half or three-quarters of a mile. After being awing for a period of perhaps three or four minutes, they came down in a more distant spot.

In the late afternoon I located the flock again at a neighboring pond, and approached under cover to a point within about 500 yards, whence I could watch at leisure. Once more they were in an extended line, probably a couple of hundred yards long, and from one to half a dozen birds deep. The water in which they stood appeared to be a foot or a foot and a half in depth. By a careful count there were approximately 220 birds in the flock. There was a very marked difference of size between individuals. Certain patriarchal-looking birds (evidently males) towered a foot or more above others, the backs of the smaller birds being just about on a level with the bellies of the larger ones. The smaller and paler birds were presumably females or subadult individuals.

The birds were constantly engaging in a sort of treading motion with their slender red legs, in order, doubtless, to stir up the small brine shrimps (*Artemia salina*) which, according to the investigations of Eagle Clarke, form the principal food of the Flamingo in this region; and meanwhile they stretched their necks downward at a slant, giraffe-like, to obtain the morsels thus brought into reach. Now and then two neighboring

birds would enter into what appeared to be a squabble,[1] with upreared heads, bill to bill, and serpentine writhings of their attenuated necks; a few moments of this, and the strange spectacle would be over. In the normal upright position their necks were gracefully curved like a Swan's. Occasionally, in part of the flock, there was a common movement in one direction or the other, either up or down the line, the birds slowly walking. Now and then there were a few honks, probably of suspicion at the distant appearance of some living object.

When I eventually approached, rather openly, a couple of hundred yards nearer, the Flamingos were surprisingly slow to be alarmed and off. At first heads were raised and honkings were heard. Then they began to move slowly and with 'stately tread', as Chapman (Camps and Cruises, 1908, p. 179) very appropriately expresses it, toward the slightly farther end of the line. Presently they came to a sort of halt, perhaps on account of deep water in that direction, and returned a little way. Thereupon the flock arose in the air. While circling a time or two, with far-outstretched necks and legs, and exposing a broadside of flaming wings, they presented such a magnificent and thrilling spectacle as comes but rarely in a bird-watcher's experience. Compact while circling at first, the flock became somewhat looser, with a tendency toward the formation of lines within it, as it finally determined upon the direction to take in its departure. Two sorts of calls were noticed, particularly while the birds were awing: a *grr-grr*, and a *honk-honk*, the former being hoarser and deeper. Possibly the difference is one of sex. On getting ready to alight, the flock set wings, practically as a whole, and went on a slight downward slant into a near-by pond.

Three days later, at this pond, I had a distant and final view of the flock. A majority, more or less bunched together, appeared to be asleep, standing on one leg and facing a strong breeze. Those few that were feeding were strung out in a scattered line—this being apparently the characteristic flock formation on such occasions. Once more I noticed the serpentine writhings of necks on the part of opposing birds, and again was impressed with the giraffe-like aspect of those whose long necks slanted to the water in feeding.

32. **Anas platyrhynchos platyrhynchos** L. MALLARD; CANARD SAUVAGE.—Several seen near Pioch, April 9, and near Icard, April 16. In the vicinity of Les Saintes Maries numbers were observed, often in pairs, from April 11 to 15. On the 13th, in a grassy, fairly dry part of the marshes, I found the picked skeleton of a male Mallard, and near it a lot of feathers that were apparently a female's. A couple of yards away, under the tall bending grass, was a deserted nest, containing five badly smelling whole eggs, besides a couple of broken ones. All this represented some unexplained tragedy of the marsh. It may, however,

[1] Eagle Clarke (1895, p. 200), however, explains this as 'billing of an amatory nature.'

have been the work of a Fox. This species is said by Eagle Clarke (1895, p. 179) to "flourish exceedingly in the Camargue," and to "make sad havoc among brooding birds and their young."

33. **Anas penelope** L. WIGEON; CANARD SIFFLEUR.—A flock of three, and a single bird, seen on April 15.

34. **Anas acuta acuta** L. PINTAIL; CANARD PILET.—A pair seen on April 15 on one of the large ponds.

35. **Spatula clypeata** (L.). SHOVELER; SOUCHET COMMUN.—The Shoveler was seen daily, from April 11 to 15, in small flocks and pairs on the ponds about Les Saintes Maries.

36. **Netta rufina** (Pallas). RED-CRESTED POCHARD; BRANTE ROUSSÂTRE.—This handsome Duck was seen daily, from April 11 to 16, on the ponds in the marshes. It was generally in pairs or in flocks of four or five. The black under parts, with the white flank patch, constitute excellent field marks for the male.

37. **Nyroca fuligula** (L.). TUFTED DUCK; MORILLON HUPPÉ.—A few Tufted Ducks, in bands of three to six, comprising both sexes, were observed on a pond in the marshes on April 15 and 16. While dozing with heads resting on backs, some of these birds kept up an automatic paddling with their legs, and so forged slowly ahead against a brisk wind. The resemblance of this species to the Ring-necked Duck (*Nyroca collaris*) is evident at a glance.

38. **Burhinus oedicnemus oedicnemus** (L.). STONE CURLEW; OEDICNÈME CRIARD.—To such a retiring species as the Stone Curlew the desolate reaches of the Camargue no doubt make a particular appeal. It was found on some slightly elevated patches of rather bare, dry ground among the marshes on April 11, 13, and 16. One, two, or three birds were noted at a time. They were not unduly wary, allowing an open approach to within 60 yards, and on one occasion, by making use of cover, I came within as many feet.

39. **Vanellus vanellus** (L.). LAPWING; VANNEAU HUPPÉ.—Several of these birds were observed on April 11 and 13. All my early views were of birds flying about over the ponds and marshes, or plunging downward at a steep slant to alight in some distant spot. The idea that birds with such wide, blunt-tipped wings could be Plovers was never entertained; they seemed rather like some exotic raptor, and their identification was for a time one of the most baffling and exasperating of puzzles. When I eventually came upon a bird *standing* at the edge of a pond, the puzzle was solved at a glance.

40. **Tringa totanus totanus** (L.). COMMON REDSHANK; CHEVALIER GAMBETTE.—This appeared to be one of the commoner shore-birds of the Camargue at the time of my visit. It was observed nearly every day, usually in small bands of less than a dozen individuals. Its note—a musical *tyoo-doo-doo*, suggestive in quality of the call of the Lesser Yellow-legs (*Totanus flavipes*)—was frequently heard. In its manner of bobbing it is reminiscent of the Greater Yellow-legs (*Totanus melanoleucus*).

The French common name, *chevalier*, which is applied to the Redshank and several of its allies, seems particularly appropriate for the graceful, long-limbed birds of this group.

41. **Actitis hypoleucos** (L.). COMMON SANDPIPER; CHEVALIER GUIGNETTE.—On April 14 a small Sandpiper dashed by me, its note and a white stripe in the wing suggesting the Spotted Sandpiper (*Actitis macularia*). It was probably the Common Sandpiper.

42. **Recurvirostra avosetta** L. AVOCET; AVOCETTE.—This splendid shore-bird, which occurs in goodly numbers in the Camargue, seems to me one of the finest ornithological treasures of the region. This is probably its principal breeding ground in France. The birds that I observed from April 10 to 16, however, did not appear to have taken up their nesting duties by that time, for they were still in flocks.

Several loose flocks or bands, aggregating from 40 or 50 to 70 individuals, were in daily evidence about one of the larger ponds. Though they were quite wary, the size of the species rendered it possible to make fairly satisfactory observations on some of their habits at a distance of more than a hundred yards.

The Avocet's plumage pattern is a very striking study in black and white, the large amount of black on its head setting it off at once from the American species (*R. americana*). When the bird is on the wing, its webbed feet, stuck far out behind, with a generous length of bill to balance them in front, give a sort of suggestion of a miniature Flamingo. Going upwind, it volplanes for a considerable distance before alighting, and comes to a rest without a flutter. The bands feed in rather loose array, with no particular formation.

For the most part they frequented the shoal water near shore, with a depth of no more than three or four inches. Here a bird walks leisurely but steadily along, with a scarcely perceptible pause at each step as it makes a quick sidewise sweep or scoop through the water with its recurved bill. The scoops are nicely synchronized with the bird's steps, the motion being toward the right as the right leg is put forward, and vice versa. Meanwhile the body is kept tilted forward, in a curious and distinctive pose, at an angle of perhaps 45° from the horizontal. A morsel is frequently secured, then swallowed with a series of quick little backward jerks of the head. At times some of the birds rested quietly well out in the pond, where they possibly floated or swam, the water coming halfway up their bodies. Here they still fed by tipping the whole body forward, so that the anterior half was out of sight beneath the surface. Even when walking about in only a few inches of water, they may immerse the head entirely in securing their food.

Various individuals, presumably males, indulged in a pugnacious display that was probably correlated with the mating season. In view of the delicacy of the Avocet's bill, it is not surprising that wings and feet seemed to be the only weapons employed in these activities. While two or more birds are feeding near each other, one takes the initiative by

walking or running—sometimes even flying—at another, thereby often forcing it to take wing. But sometimes there is resistance, resulting in the employment of wings by both parties, apparently for defensive as well as for offensive purposes. Again, the bird attacked or threatened may curiously squat down in the water, as if to let the attack pass over it. Once, however, I saw the aggressor land with both feet for an instant on the back of the crouching bird; and at another time this seemed to very nearly happen.

The Avocet's call is a clear, musical, and slightly explosive *hoot'h*. In quality it is quite unlike, for example, the loud, piercing whistle of a Greater Yellow-legs (*Totanus melanoleucus*).

43. **Numenius arquata arquata** (L.). COMMON CURLEW; COURLIS.—On April 11 I found about half a dozen birds of this genus in the marshes. At least one was undoubtedly a Common Curlew, giving a cry of *cur-reé-oo*. Still another species seemed to be represented, but whether it was *phaeopus* or *tenuirostris*, I could not determine.

44. **Capella gallinago gallinago** (L.). COMMON SNIPE; BÉCASSINE ORDINAIRE.—A Snipe, presumably of this species, was observed on April 16. Its *scaipe* note was similar to that of the American species (*delicata*).

45. **Haematopus ostralegus ostralegus** L. OYSTER-CATCHER; HUÎTRIER PIE.—I made the acquaintance of this interesting species on April 9, when I found a pair feeding in a lagoon adjoining the sea. They moved into deeper and deeper water until their bodies touched the surface. In feeding here they immersed their heads entirely. When they flushed at a distance of 125 to 150 yards, they made off with a very steady, direct flight, their wing tips just clearing the surface of the lagoon. They set their wings just before alighting in very shoal water, and reduced the shock of landing by taking perhaps half a dozen running steps before coming to a final halt.

During the next few days Oyster-catchers were frequently seen in small numbers, particularly about the shallow borders of a large pond. At this time they were indulging in various antics evidently pertaining to the mating season. A flock of half a dozen one morning were making a considerable clamor with their whistled calls. A couple of birds would assume a belligerent attitude toward each other, with bills pointed down, like roosters sparring. One would then run at the other, causing it to fly off a few feet. The calls seem to be given most during this part of the performance. The usual note sounds like *pheéou*, but this is often shortened to *phee*. On another occasion, when two birds were joined by a third, one of the former apparently endeavored to ward off the newcomer. These two (presumably males) walked along side by side, with bills lowered in a threatening manner, and loudly uttering their notes.

46. **Sterna hirundo hirundo** L. COMMON TERN; STERNE PIERRE-GARIN.—This Tern was observed in small numbers throughout my stay at Les Saintes Maries, from April 9 to 16.

47. **Larus fuscus** subsp. LESSER BLACK-BACKED GULL; GOÉLAND BRUN.—Two individuals seen on April 9, and two small bands on April 12.

48. **Larus ridibundus ridibundus** L. BLACK-HEADED GULL; MOUETTE RIEUSE.—Observed in small numbers daily, April 10 to 13. The birds often rested on the ponds.

49. **Fulica atra atra** L. COOT; FOULQUE MACROULE.—In April this is apparently one of the commonest waterfowl of the Camargue. From one to two or three hundred individuals were noted on the ponds near Les Saintes Maries on nearly every day from the 9th to 16th. On one occasion a bird was seen to display in the same manner as *Fulica americana*. It moved threateningly toward one or two others, with lowered head and with wings arched over its back, causing them to patter away over the surface of the water for a short distance.

50. **Alectoris rufa rufa** (L.). RED-LEGGED PARTRIDGE; PERDRIX ROUGE.—While journeying by rail from Arles to Les Saintes Maries on April 9, I observed several Partridges near Les Bruns and Pioch; and on the return trip on April 16 several others were noted near Maguelonne and Pioch. The white patches plainly seen on the heads of some of the birds served to identify them as this species.

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THE RACES OF THE BARE-THROATED FRANCOLIN, PTERNISTES CRANCHI.

BY H. B. CONOVER.

RECENTLY, while identifying specimens of *Pternistes cranchi* from the Belgian Congo, Tanganyika, Uganda and Kenya, it became apparent that there was a great deal of misunderstanding regarding the different races, especially *Pternistes cranchi intercedens* (Reichenow) to which most authors have referred specimens from the vicinity of Lake Victoria. True *intercedens* is from farther south in Tanganyika and the assumption that it ranges to Lake Victoria does not seem justified.

Besides the typical race, type locality lower Congo Valley, the following have been named:

(a) *P. c. harterti* (Reichenow), type locality Usumbura, at north end of Lake Tanganyika. This is a very distinctively marked bird, having wide blackish or reddish black, instead of chestnut, edges to the feathers of the breast. Its range is confined to a very small area, the Rusisi Valley, at the north end of Lake Tanganyika.

(b) *P. c. bohmi* (Reichenow), type locality Igonda, Tanganyika Territory. This also is a very distinct race. The feathers of the foreneck, chest, breast, and belly have very wide black shaft stripes. The breast and belly are white, practically unvermiculated, with broad chestnut edges separated from the white by a definite black streak. This gives to the breast the appearance of being made up of streaks of black, white, and chestnut. In this respect it very much resembles the breast of *Pternistes rufopictus.*

(c) *P. c. intercedens* (Reichenow), type locality Lake Rukwa, Tanganyika Territory. As Reichenow says in his description, this race is a transitional form between *P. c. cranchi* and *P. c. bohmi.* He differentiates it from typical *cranchi* by stating that the black shaft stripes on the crop are heavier, and the breast feathers are largely white almost without any gray vermiculations. Regarding

the first part of this statement, since typical *P. cranchi* has no shaft stripes, it would seem that Reichenow used for comparison birds from Uganda or northern Tanganyika, which have narrow dark shaft streaks. He mentions also as belonging to the race *intercedens* (although not exactly agreeing with the type) some specimens referred to by Sharpe from Nyasaland (Ibis 1906, p. 507). Sharpe compares these Nyasaland birds with specimens from the Ruwenzori region, and says the former "have blacker longitudinal streaks on the foreneck and chest, while the breast feathers in particular are whiter with scarcely any vermiculations." This is essentially the same as the statement made by Reichenow in comparing *intercedens* with *cranchi*. Therefore, birds from Uganda cannot be *intercedens*, as many authors have classified them but must be either *cranchi* or some other race.

I have not been able to study any specimens of *P. c. intercedens* from near the type locality or from Nyasaland, but have had two specimens from Tabora, Tanganyika, which I have called *intercedens*. These specimens are practically intermediate between *P. c. cranchi* and *P. c. bohmi*. They correspond to the description, having shaft streaks heavier than specimens from Uganda and the Lake Victoria region, but not nearly so heavy as in true *bohmi*. The breast feathers also are only very slightly vermiculated with gray.

This leaves the birds from about the west, east and south shores of Lake Victoria without a name, since specimens from these regions agree with each other but differ from typical *cranchi*. This race, therefore, may be known as

Pternistes cranchi nyanzae subsp. nov.

Type from Fort Ternan, Nyando Valley, Kisumu, Kenya Colony, altitude 6000′. No. 6193, adult male in the Conover Collection, Field Museum of Natural History. Collected in November, 1901 by Sir Frederick J. Jackson.

Characters.—Nearest to *P. c. cranchi* but differs by having narrow black shaft streaks on the feathers of the foreneck, chest, and upper breast. These streaks are practically confined to the shafts. On the average slightly darker and more brownish (less grayish) on the upper parts. General appearance of the underparts more streaked. Light background of feathers of the underparts more grayish, less white, forming less of a contrast with the gray vermiculations.

Differs from *P. c. intercedens* and *P. c. bohmi* by the much narrower shaft streaks on the feathers of the underparts; and by the feathers of the breast and belly being *heavily* vermiculated.

Differs from *P. c. harterti* in having chestnut, not blackish, edgings to the feathers of the breast; by having all the underparts heavily vermiculated; and by having narrow dark shaft streaks to the feathers of the foreneck, chest and upper breast.

Description.—Lores and superciliary stripe black. Feathers on the sides of the face (except ear-coverts which are brown) black narrowly margined with white. Top of the head and nape mummy brown. Feathers of the back of the neck finely mottled with dark gray and white and with dark shaft streaks. Rest of upper parts mummy brown, with darker brown shaft streaks. Quills brown, outer webs of the inner secondaries finely mottled with black. Foreneck, chest, and upper breast finely mottled dull white and dark gray, each feather with a narrow dark shaft streak. Lower breast and belly like the chest but each feather with wide chestnut margins. Anal region dull brownish finely mottled with white. Under tail coverts dull brown mottled with black. Tail mummy brown. Wing (flat) 196, tail 90 culmen (exposed) 29, tarsus 66, middle toe (with claw) 51 mm.

Range.—Country adjacent to the east, south and west shores of Lake Victoria Nyanza.

SPECIMENS EXAMINED.

Pternistes cranchi cranchi.—BELGIAN CONGO: Boma 1 ♂[3]; Matadi, Lower Congo 1 ♀[3]; Kasai Dist. Luluabourg 1 ♀, 1 ♂[3]; Prov. Katanga, Tanganyika Dist. 1 ♀[1]; Haut Luapula Dist. 2 ♀, 6♂.[1] ANGOLA: Ndalla Tando 1 ♀.[1]

Pternistes cranchi harterti.—LAKE TANGANYIKA: Uvira, 1 ♂[3]; Rusisi Valley 1 ♂, 1 ♀.[3]

Pternistes cranchi bohmi.—TANGANYIKA: nr. Singidda 1 ♀[3]; nr. Itigi 1♀, 1 ♂[4]; Saranda 1 ♀.[4]

Pternistes cranchi intercedens.—TANGANYIKA: Tabora 1 ♂, 1 ♀[4]; Kigoma 1 ♂ im.[1]

Pternistes cranchi nyanzae.—KENYA: Nyando Valley 2 ♂, 1 ♀.[1] UGANDA: Lake Mutanda 1 ♂, 1♀[2]; Lower Rutshuru Valley 1♂[3]; Toro 1♂[1]; Kisolo 4 ♂, 3 ♀[2]; Ankole 4 ♂, 2 ♀.[1] TANGANYIKA: Mwanza 4 ♂; 4 ♀[1 4]; Muroga Range 1 ♂, 1 ♀[3]; Grunette River 1 ♂, 1 ♀[3]; Nyanza, E. shore Lake Tanganyika 1 ♂[3] (not typical).

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[1] Specimens in Conover Collection, Field Museum, Chicago.
[2] Specimens in Field Museum, Chicago.
[3] Specimens in American Museum, New York.
[4] Specimens in Museum of Comparative Zoology, Cambridge.

Key to the races of *Pternistes cranchi.*

A. Feathers of the breast widely edged with chestnut.
  a. Feathers of the breast and belly heavily vermiculated
    a′. No shaft stripes to the feathers of the foreneck, chest and upper breast.....*P. c. cranchi*
    b′. Very narrow dark shaft stripes to the feathers of the foreneck, chest and upper breast.....*P. c. nyanzae*
  b. Feathers of the breast and belly not heavily vermiculated
    c′. Very broad shaft stripes to the feathers of the underparts, breast and belly practically unvermiculated...*P. c. bohmi*
    d′. Shaft stripes to feathers of the underparts narrower, breast and belly slightly vermiculated.....*P. c. intercedens*
B. Feathers of the breast widely edged with blackish or reddish black *P. c. harterti*

I am indebted to the officials of the following institutions for the loan of specimens necessary for this investigation: Field Museum of Natural History, Chicago; American Museum of Natural History, New York; Museum of Comparative Zoology, Cambridge. I am indebted also to Dr. James P. Chapin for valuable information, especially as to the restricted range of *P. c. harterti.*

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RELATIONSHIPS OF THE RACES OF PHAEOPROGNE TAPERA AND THEIR PROBABLE SIGNIFICANCE.

BY FRANK M. CHAPMAN.

THE PROBLEM.

THE genus *Phaeoprogne* of Baird is confined to South America, ranging from northern Venezuela southward through the Tropical Zone and beyond to the Province of Buenos Aires, Argentina. It contains two forms, a northern and a southern one. For the former, in 1912, I proposed the name *Phaeoprogne tapera immaculata* in the belief that the name *tapera* of Linneus was applicable to the latter. But in 'The Auk' for April, 1929, Mr. W. E. Clyde Todd,[1] confirming Baird,[2] shows that the northern bird should be known as *tapera* Linneus, the southern, as *fusca* Vieillot. Dr. Hellmayr[3] has also reached the same conclusion, and in its fundamental aspects we may, therefore, consider this question of names as nearly settled as such questions ever can be.

Mr. Todd, however, calls these birds *Phaeoprogne tapera* and *Phaeoprogne fusca*, while I would call them *Phaeoprogne tapera tapera* and *Phaeoprogne tapera fusca*. This sounds very much like the difference between tweedledum and tweedledee, but I hope to show that the use here of binomials conceals certain significant biological facts to which, so far as nomenclature can, trinomials give expression.

Mr. Todd does not hesitate to state in italics that these two birds are "perfectly distinct *species*" and "that their respective ranges overlap over an extensive area." It is my belief, however, that these two forms are mutually representative, intergrading races and that their breeding ranges overlap only along the line of intergradation. The evidence on which this opinion is based seems to me to be of sufficient importance to warrant presentation.

The problem is not a new one to me. In 1917,[4] when writing on Colombian birds, I stated that I was unable to explain it, but

[1] The Auk, XLVI, 1929, pp. 186–189.
[2] Rev. Amer. Bds., 1865, pp. 285, 286.
[3] Field Mus. Pub., 255, 1929, p. 265.
[4] Bull. Amer. Mus. Nat. Hist., XXXVI, 1917, p. 503.

treated the two forms as subspecies. In referring to this paper Mr. Todd (*loc. cit.*) writes that I "admitted that they behaved as if they were two different species." While this comment doubtless relates to my discussion of the birds' relationship, it might be interpreted as applying to their habits, whereas I know nothing pertinent concerning the behavior of either race.

THE EVIDENCE.

The coloration of these two birds may be easily visualized if we liken the northern *P. t. tapera* to a Rough-winged Swallow, the southern *P. t. fusca* to a Bank Swallow with a median line of spots extending from the center of the breast-band to the belly. In size[2] and in the color of the upper parts the two birds agree, the differences between them being evident only on the lower parts. These differences consist chiefly in the possession by *fusca* of a line of spots from the center of the pectoral band usually to the center of the belly; these parts being grayish anteriorly, white posteriorly, unmarked in *tapera*. In many specimens of *fusca* the throat is whiter and more sharply demarked from the breast-band, which is more clearly defined than in *tapera*.

The plain-breasted bird, *tapera*, is known to range from Bahia, the lower Xingú, Tapajoz, Purús, upper Ucayali, and northwest Peru, north to the Guianas, Caribbean slopes of Venezuela, and vicinity of Carthagena, Colombia.

The spotted-breasted bird, *fusca*, is known to occupy the area from Santa Cruz, Bolivia, and Matto Grosso, Brazil, south to the

[2] My material does not confirm Mr. Todd's statement that "the distance between the tips of the longest secondaries and the tips of the longest primaries in the closed wing . . . is constantly longer in *fusca* than in *tapera* by 10 mm. or more . . ." For example: in four females of *fusca* from Matto Grosso, Brazil, this measurement is 54, 54, 55 and 58 mm., while in five females of *tapera* from the junction of the Napo and Marañon it is 60, 60, 62, 65, 66 mm. Again, in two males from La Plata, Argentina, it is 60 and 70 respectively, while in two from Maripa on the lower Orinoco, it is 60 and 68 respectively. Measurements of 51 additional specimens confirm those just given. The truth is that the extent of this measurement is affected by the make-up of the skin. If, as usual when skinning, the secondaries are stripped from at least the proximal half of the ulna, their subsequent position in the closed wing of the dried skin depends upon the extent to which the wing is closed and the degree of accuracy with which they are restored to their original point of attachment. Both these factors are variable, with consequent variability in "the distance between the tips of the longest secondaries and the tips of the longest primaries," which prevents this measurement from being diagnostic.

Area 1. *Phaeoprogne tapera tapera.*

Area 2. *Phaeoprogne tapera fusca.* Black dots represent localities within the range of the former at which *P. t. fusca* has been taken.

Province of Buenos Aires, Argentina. From this area *tapera* is unknown; *but scattered individuals of typical fusca have been found throughout the range of tapera.* This is the crux of the problem.

Mr. Todd records six such specimens from two localities in northern Venezuela among his 61 specimens of *tapera*. The American Museum has eleven such specimens from five localities in the range of *tapera tapera*.

It is on the occurrence of these specimens of *fusca* in the range of *tapera* that Mr. Todd doubtless bases his belief in the specific distinctness of the two birds as well as his statement that "their respective ranges overlap over an extensive area." But in my opinion, these northern specimens of *fusca* are winter visitants probably from the southern part of its range. If this be true, it has an obvious bearing on the relationships of the two birds, and is also an important addition to our scanty knowledge of the winter range of birds that migrate northward after nesting in Argentina and adjoining areas. The evidence on which this belief is based is as follows:

1. In at least the southern part of its range *fusca* is a migrant. Wetmore[1] writes that at Kilometer 80, west of Puerto Pinasco, Paraguay, it was not seen until September 17, 1920, and that on October 21 it was already present at Dolores, Buenos Aires. Daguerre[2] states that in Rosas, F. C. S., Argentina, this Martin arrives at the end of October and departs at the end of April. On the other hand, Young,[3] writing from the coastland of British Guiana, records "*Progne tapera*" as present from May to September and writes "I have not seen any at other times of the year, which might suggest that these were non-breeding birds." This statement, in connection with Hellmayr's record of *fusca* from Georgetown, suggests that true *tapera* does not breed on the Guiana coast.

2. With exceptions which appear to be explainable, the available records of *fusca* from the range of *tapera* were made during its non-breeding season. They are as follows: Brazil: San Bento, Maranh˜o, ♀ ad., Aug. 28, 1923.[4] Peru: Orosa, south bank Marañon below Iquitos, 3 ♂, Sept. 11, 1926. Venezuela: Es-

[1] Bull. U. S. Nat. Mus., No. 133, 1926, p. 345.
[2] El Hornero, II, 1922, p. 269.
[3] Ibis, 1929, p. 237.
[4] Pub. 255, Field Mus., 1929, p. 265. Hellmayr mentions also specimens with spotted breasts from Maribitañas on the Rio Negro and Georgetown, British Guiana.

meralda, upper Orinoco, 1 ♂, 1 ♀, Oct. 2, 1 ♀, Oct. 29, 1 ♀, Nov. 1, 1 ♀? Nov. 6; Suapure, lower Orinoco, 1 ♀, Apr. 27, 1899; El Trompillo, Carababo,[1] 1 ♂, May 11, 1914, 1 ♂, May 14, 1914, 1 ♂, May 18, 1914, 1 ♀, May 19, 1914; Guachi, Zulia,[1] 2 ♂, Aug. 23, 1922. Colombia: Turbaco, near Cartagena, 1 ♂, Aug. 3, 1911; Rio Sinu, 1 ♀, Nov. 21, 1911.

The November dates above recorded are sufficiently near the breeding season of *fusca* to call for comment.

Although *fusca* reaches the Province of Buenos Aires in September, Hudson[2] states that it does not nest until November or December, and Gibson[3] writes that "eggs are most generally taken in December." This late date has been attributed to the bird's habit of using the homes of the Ovenbird (*Furnarius*) and the necessity of waiting until the young of that species had flown; but Friedmann[4] records finding at Santa Elena, Entre Rios, "a nest in a hole about thirty feet up in a tall tree" on January 13, containing "one young bird nearly ready to leave." Whatever, therefore, may be the cause for the delay of *fusca* in nesting, it is evident that even birds taken in Colombia in late November could readily reach their nesting grounds near the beginning of the breeding season of their species.

Swallows are rapid flyers, and in this connection it is desirable to recall that in the spring our Barn Swallow is found in South America for at least six weeks after it reaches the latitude of Washington. We have specimens taken at Corumbá in southern Brazil, March 23, on the coast of Peru, April 10, and the Bogotá Savanna, May 13, while Todd and Carriker[5] state that it was present in large numbers around Rio Hacha (Santa Marta) during the first week of May, 1914.

So far, therefore, as their dates of occurrence are concerned, there is no reason to doubt that the specimens of *fusca* here recorded from the range of *tapera* are winter visitants.

3. The plumage of specimens of *fusca* from the range of *tapera* indicate that they were migrants.

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[1] Coll. Carnegie Mus.
[2] Proc. Zool. Soc., 1872, p. 608.
[3] Ibis, 1880, p. 23.
[4] Bull. Mus. Comp. Zool LXVIII, 1927, p. 210.
[5] Ann. Carn. Mus., XIV, 1922, p. 435.

It is well known that as a rule the "fall" molt (postnuptial or postjuvenal) in Swallows is deferred until the birds reach their winter quarters. With this fact in mind let us examine our specimens of *fusca* from the range of *tapera*. I follow the order in which they are listed above. The three males from Orosa (Sept. 11) are in fresh, wholly unworn plumage and have evidently just finished the molt. The sexual organs were not enlarged. On the contrary, two males of *tapera tapera* taken at the same place on the same day are in somewhat worn plumage and had large testes. Apparently, therefore, the specimens of *fusca* were migrants, those of *tapera* breeding birds. All the Esmeralda (Oct. 2–Nov. 6) birds are nearing the end of a complete molt. Since the primaries are still involved the cause for their late stay seems apparent. The Suapure (April 27) bird is in much worn plumage but has new first and second (from within) primaries in each wing. Presumably it had but recently arrived from the south and was beginning its postnuptial molt. Two specimens of *tapera tapera* taken at the same locality April 8 and 30 are just completing a full molt.

Three of the four May specimens of *fusca* from El Trompillo are essentially like the April 27 specimen from Suapure, that is, in worn plumage and beginning to molt. In the fourth (May 18) the molt has apparently not yet started. The August specimens from El Guachi, Venezuela, and Turbaco, Colombia, and the November bird from the Rio Sinu, are just concluding a full molt.

It appears, therefore, that, excepting the three freshly plumaged September specimens from Orosa and one worn May specimen from El Trompillo, all my "winter" specimens of *fusca* are in molt. On the other hand, not one of my 30 specimens of *fusca* taken in their breeding range between September 3 (Chapada, Matto Grosso) and April 1 (Corumbá, Matto Grosso) show signs of molt.

4. The American Museum has an ultra-typical specimen (wing, 104 mm.) of *Pygochelidon patagonica*, taken at Cumaná, northeastern Venezuela, May 23, 1925, by G. H. H. Tate. It is in worn, faded plumage, while a male of *P. cyanoleuca* (wing, 89 mm.) taken at San Antonio, northeastern Venezuela, April 27, is in fresh plumage. We have also six specimens of this South Temper-

ate Zone species taken by Watkins at Perico, Rio Chinchipe, North Peru, July 20, and one from San Ignacio, July 2. There are both adult and immature birds in this series and all are in molt. This species is not known to nest north of Argentina and is migratory from at least Buenos Aires southward.[1]

There is no reason to doubt that all these Martins and Swallows were 'winter' visitants at the localities in which they were taken; nor indeed should we be surprised that these highly mobile creatures should extend their migrations from Argentina to the Caribbean when we recall that our own Barn Swallow winters as far south as Argentina.

RELATIONSHIPS.

If, as I believe, the evidence above presented shows that the specimens of *fusca* occurring in the range of *tapera* are 'winter' visitants and not residents, and that hence the ranges of the two forms do not "overlap over an extensive area" and consequently that they are not unquestionably specifically distinct from each other, what then are their relationships?

Unfortunately, my material does not afford a conclusive answer to this question. Between the southern known breeding limits of *tapera* and the northern known breeding limits of *fusca* there is a wide area from which we have no specimens. However, the specimens available warrant the advance of some suggestions. They are: (1) the breast-spots of *fusca* are a mutational character; (2) the whiter throat and better defined breast-band of some specimens of *fusca* are geographic characters; (3) the two forms intergrade.

Now let us see to what extent these theories are supported by facts and their interpretation.

Sixteen of our fifty-six specimens of *tapera tapera* show a tendency toward the development of spots on the breast. In some they are barely evident, in others so well marked that, so far as this character is concerned, these specimens are fairly intermediate between *tapera* and *fusca*. These birds are from the upper Ucayali, Orosa, and Puerto Indiana at the mouth of the Napo, Peru; Rio Curaray, and Duran, opposite Guayaquil, Ecuador; Manaos, Brazil; and

[1] Chapman, Amer. Mus. Novit., 30, 1922, p. 4.

Maripa, lower Orinoco, Venezuela. There is thus exhibited by specimens from throughout a large part of the range of *tapera* a tendency to develop, by individual variation, that is, mutation, black spots on the breast. In some specimens these spots are so well developed that they approach certain specimens of *fusca*, which have a minimum number of spots. It is within the range of demonstrated possibilities that given favorable environmental condition this inherent tendency to vary in a definite direction might become a dominant characteristic. Such conditions appear to have arisen as *tapera* has extended its range southward into Argentina.

Further evidence that these breast spots are mutational in character is supplied by the sporadic occurrence of the same type of marking in other Swallows. It is more frequently present than absent in *Riparia riparia riparia*, in some specimens of which these central breast spots are so well developed that they look like miniatures of *Phaeoprogne t. fusca*. Such specimens suggest that fundamentally and germinally these two species are more closely related than our classification indicates. We have also a specimen of *Riparia cincta suahelica* from Elmenteita, Kenya Colony, which has more spots on the median breast line than most specimens of *fusca*. In specimens of the three forms of *Pygochelidon* median breast-spots are not infrequent and the occurrence of this unusual marking in these, and possibly other Swallows, is an evidence of their common origin.

It has been said that some specimens of *fusca* have the throat whiter and more clearly defined from the sharply marked brownish gray breast-band than others. Specimens from the southern part of the range of this race are thus marked.[1] It is also significant that all the specimens herein recorded from the range of *tapera* are of this character; and, as migrants, it is not impossible, though wholly theoretical, that these northern birds may have come from the southern part of the range of the race.

In Matto Grosso these throat and breast characters are by no means so well marked; the throat averages grayer and the pectoral band, as a rule, is no better defined than it is in *tapera*. Were it

[1] Fort Wheeler, Paraguay; Embarcacion and La Plata, Argentina; Palmares, Rio Grande do Sul, Brazil.

not for their breast-spots it would not, indeed, be possible to separate most Matto Grosso specimens from average examples of *tapera*. Even in the last-named character a specimen from Descalvaldos, Matto Grosso, so closely approaches one from Manaos and another from the Curaray, eastern Ecuador, and a third from the upper Ucayali, Peru, that no one seeing these four examples would question the propriety of applying the same name to them all; while of the intergradation of the two forms they represent not the slightest doubt can be entertained.

CONCLUSIONS.

From the study of this material and its associated data I venture to present the following conclusions: (1) That the specimens of *fusca* taken in the range of *tapera* are not residents but "winter" visitants. (2) That migrants from the South Temperate Zone winter as far north as the Caribbean. (3) That the breast-spots of *fusca* are mutational in nature and in *Phaeoprogne* have their origin in *tapera* from which *fusca* was derived. (4) That the white throat and well defined pectoral band are most fully developed in the more southern specimens of *fusca*. (5) That in these respects specimens from Matto Grosso are intermediate. (6) That *tapera* and *fusca* intergrade in part by individual variation in the development of the breast-spots, in part by geographic variation in the color of the throat and pectoral band.

SPECIMENS EXAMINED.

I am deeply indebted to Mr. W. E. Clyde Todd for the loan of the four specimens from El Trompillo, and two from Venezuela. The remaining specimens are in the collection of the American Museum.

Phaeoprogne tapera tapera.—Brazil: Bahia, 1; Santa Rita, Bahia, 1 (Aug. 11); Victoria, Rio Xingú, 1 (Feb.); Manaos, 2 (July 25). Peru: mouth Urubamba, 1 (Oct. 12); Lagarto, upper Ucayali, 2 (Feb. 22, 26); Sta. Rosa, upper Ucayali, 4 (Nov. 18–21); Orosa, Marañon, 3 (Sept. 5–11); Pto. Indiana, Napo and Marañon, 6 (June 16–28); Pilares, Piuva. 4 (June 16–18); Lamor, Piuva, 1 (June 13). Ecuador: Curaray and Napo, 1 (Jan. 20), 1 (Feb. 1), 2 (May 5, 7), 4 (Dec. 11); Duran, opp. Guayaquil, 3 (May 21), 2 (July 3, 4). Venezuela: Maripa, lower Orinoco, 2 (Mar. 1, 2), 1 (May 15), 3 (Dec. 11–23); Suapure, lower Orinoco, 2 (Apr. 8, 30);

Tucacas. Falcon, 1 (Oct. 18); Campos de Merida, 1 (Nov. 8). Colombia: Chicoral, upper Magdalena, 3 (Oct. 6, 10); Algodonal, lower Magdalena, 2 (Jan. 23); Bogota, 1.

Phaeoprogne tapera fusca.—Argentina: La Plata, Buenos Aires, 2 (Sept., Jan.); Embarcacion, Salta, 1 (Jan. 28); Paraguay: Fort Wheeler, Chaco, 1 (Oct. 12). Brazil: Palmares, sea-level, Rio Grande do Sul, 5 (Oct. 7–15); Corumbá, 1 (Apr. 1), 1 (Nov. 9); Urucum, near Corumbá, 4 (Dec. 1–15); Rio Taquary, Matto Grosso, 2 (Dec. 19); San Lorenzo River, Matto Grosso, 1 (Jan. 2); Descalvados, Matto Grosso, 2 (Nov. 20); Chapada, Matto Grosso, 1 (Jan. 29), 2 (Feb. 6), 2 (Sept. 3, 7), 1 (Oct. 30), 3 (Nov. 15, 30), 1 (Dec. 1). Peru: Orosa, Marañon, 3 (Sept. 11). Venezuela: Esmeralda, upper Orinoco, 5 (Oct. 2–Nov. 6); Suapure, lower Orinoco, 1 (Apr. 27); El Trompillo, Carababo,[1] 4 (May 11–18); Guachi, Zulia,[1] 2 (Aug. 23). Colombia: Turbaco, near Cartagena, 1 (Aug. 3) Rio Sinu, 1 (Nov. 21).

[1] Coll. Carnegie Museum.

American Museum of Natural History,
New York City.

NOTES ON THE BIRDS OF HISPANIOLA.

BY STUART T. DANFORTH.

DURING the summer of 1927 the author spent the period from June 14 to August 10 on the island of Hispaniola. From June 14 to July 27 he was accompanied by Mr. Frank P. Mathews of New York, and from July 2 to August 10 by Mr. John T. Emlen, Jr., of Philadelphia. We took an old Ford car over from Porto Rico, and most of our trips on the island were to places it was possible to visit by this method of transportation. Mathews and I landed at Santo Domingo City on June 14, and thanks to the prompt action and courtesy of the Dominican officials we were enabled to begin collecting the following day.

We stayed in the vicinity of Santo Domingo City until June 18, when we started across the island to Monte Cristi on the arid north coast, and worked in and near that town until June 28, with side trips to the irrigation project at Vázquez, and to Laguna del Salodillo, a large fresh water swamp near the Haitian border. June 29 and 30 we spent in the region of La Vega. Pine forests are found in the hills near that town. Then we had to return to Santo Domingo City, where on July 2 Emlen joined our party. From July 4 to 7 we collected at Higüey, Seybo and Hato Mayor in the eastern part of the island, and from July 9 to 11 in the vicinity of San Juan in the western part of the Dominican Republic. That region is fairly well wooded, and it was there that we found Parrots, Paroquets and many other interesting birds most abundant. On July 12 we crossed the border into Haiti at Comendador, going through Belladère and Las Cahobas to Port-au-Prince. On July 15 the U. S. Marine Corps furnished us free airplane transportation to Gonave Island, where we were the guests of Lieutenant Workus at Anse-à-galets until July 20. While on Gonave Island we collected only in the region between Anse-à-galets and Étroits, with the exception of a trip Mathews made to Boucan Legume. From July 22 to 24 the party split up for a few days, Mathews and Emlen paying a visit to the mountainous country at Kenscoff, while I made a trip to Lake Miragoane, the

coffee region known as Fond des Negres, Aquin, and Cayes, on the south peninsula. On July 27 Mathews embarked for New York. July 28 and 29 Emlen and I collected at some sloughs near the lower part of the Artibonite River northwest of St. Marc. We had previously visited the Étang Bois-Neuf, a brackish water lagoon south of St. Marc. July 30 we visited the Flamingo colony near Les Salines at the mouth of the Artibonite River. July 31 we proceeded to Cap Haïtien. August 2 and 3 we spent on Citadelle Hill near Milot, and on the 4th we recrossed the border (at Dajabón) back into the Dominican Republic, where we made a short second stay at Monte Cristi. August 7 we spent in the forested hills near Bonao, as guests of Dr. Ciferri, Director of the National Agricultural School, and his brother. Then we returned to Santo Domingo City, where on August 10 we embarked for Porto Rico.

Mathews and Emlen have most generously placed their field notes at my disposal, for which I wish to express to them my sincere thanks. These notes have been freely used in the preparation of this paper.

The birds collected by Mathews have been deposited in the American Museum of Natural History in New York. Those collected by Emlen have been presented to the Academy of Natural Sciences of Philadelphia, while mine are in my private collection, which is at present deposited at the College of Agriculture of the University of Porto Rico.

Dr. George N. Wolcott, formerly of the Service Technique in Port-au-Prince, Haiti, has examined the insect part of the contents of the bird stomachs, and all insect determinations were made by him. I wish to express my gratitude to him for this valuable service.

An annotated list of the birds observed and collected follows.

Podilymbus podiceps antillarum Bangs. WEST INDIAN PIED-BILLED GREBE.—About ten were noted at Laguna del Salodillo, and lesser numbers at some sinkhole ponds at Los Tres Ojos de Agua near Santo Domingo City, at a small lagoon at Haina, and at some sloughs near the Artibonite River in Haiti, where on July 28 and 29 some young about a third grown were seen.

Oceanites oceanicus Kuhl. WILSON'S PETREL.—Three followed the S. S. "Catherine" for about an hour off the southeast coast of the Dominican Republic on June 14.

Puffinus lherminieri lherminieri Lesson. AUDUBON'S SHEARWATER.—Emlen found this species common about fifty miles north of Puerto Plata on June 30.

Phaëthon lepturus catesbyi Brandt. YELLOW-BILLED TROPIC BIRD.—Emlen saw three at Puerto Plata on June 30.

Pelecanus occidentalis occidentalis Linné. Brown PELICAN.—Observed at Boca Chica and San Pedro de Macoris, R. D., St. Marc and Les Salines, Haiti, and on Gonave Island.

Sula leucogastra leucogastra Boddaert. BOOBY.—A few seen off Saona Island on June 14 and Aug. 10. Mathews saw three at Bouçan Legume, Gonave Island, on July 18.

Sula piscator Linné. RED-FOOTED BOOBY.—Mathews saw one near Saona Island on June 14.

Fregata magnificens Mathews. MAN-O-WAR BIRD.—A few seen off Saona Island June 14; in Santo Domingo Harbor June 14; San Pedro de Macoris July 1; Boca Chica July 4; Gonave Island July 17–20.

Ardea herodias adoxa Oberholser. WEST INDIAN GREAT BLUE HERON.—Recorded at Monte Cristi June 24–27 and Aug. 5; Aquin July 23; Les Salines July 30; and Gonave Island July 16.

Casmerodius alba egretta Gmelin. EGRET.—One seen at Laguna del Salodillo on June 26 and three at Les Salines on July 30 constituted our only records.

Egretta thula thula Molina.—Two seen at an irrigation pond at Vázquez on June 25; one in mangrove swamps at Monte Cristi on Aug. 5; and two by the river at Bonao on Aug. 7.

Dichromanassa rufescens Gmelin. REDDISH EGRET.—Two seen at Artibonite Sloughs on July 29.

Hydranassa tricolor ruficollis Gosse. LOUISIANA HERON.—Found practically everywhere in suitable localities. Recorded at Monte Cristi, Laguna del Salodillo, Vázquez, Port-au-Prince, Aquin, Lake Miragoane, Gonaïves marshes, Les Salines, Cap Haïtien and Anse-à-galets. Specimens were collected at Monte Cristi and Laguna del Salodillo. The stomach of one collected at Monte Cristi contained eight small fishes.

Florida caerulea caerulescens Latham. LITTLE BLUE HERON.—Fairly common and generally distributed, found at practically all points visited. Scarce on Gonave Island, where found only by Mathews.

Butorides virescens maculatus Boddaert. WEST INDIAN GREEN HERON.—Common, and found at practically all points visited, including Gonave Island.

Nycticorax nycticorax naevius Boddaert. BLACK CROWNED NIGHT HERON.—An adult seen at the Artibonite Sloughs on July 29, and six adults at Les Salines on July 30.

Nyctanassa violacea violacea Linné. YELLOW CROWNED NIGHT HERON.—Fairly common. Recorded at Monte Cristi, San Juan, Bonao, St. Marc, Les Salines and Cayes.

Ixobrychus exilis exilis Gmelin. LEAST BITTERN.—Our only record was of one seen in some cattails at Laguna del Salodillo on June 26.

Ajaia ajaja Linné. ROSEATE SPOONBILL.—Eight were seen at Laguna del Salodillo on June 26, and three in some marshes near the mouth of the Artibonite River on July 30.

Plegadis falcinellus falcinellus Linné. GLOSSY IBIS.—A bird of this species frequented the Artibonite Sloughs, where Emlen and I observed it on July 28. It kept flying around over the marshes emitting a harsh grating sound, but always managed to keep just out of gunshot. The species has been recorded from the island by Verrill as a straggler.

Phoenicopterus ruber. FLAMINGO.—On July 30 Emlen and I visited a colony of Flamingos on some extensive flat salt marshes near the mouth of the Artibonite River in Haiti. About 150 birds frequented this region, but we could find no evidence of their nesting. The marshes extended for miles of barren mud with no vegetation. The birds that frequented these barren mudflats were shy and difficult of approach, but some birds fed near mangroves at the edge of the mudflats. By creeping stealthily through the mangroves we managed to get close enough to a flock of 92 for Emlen to photograph some of the birds. They walked sedately in phalanx formation, often stopping to grovel their bills in the mud. Their note was a low-pitched *ker-wonk*, with a somewhat metallic character suggestive of the note of a wild goose. We also heard of the recent occurrence of Flamingos at Les Étroites on Gonave Island, but did not succeed in finding them there.

Dendrocygna arborea Linné. WEST INDIAN TREE DUCK.—Very abundant at Laguna del Salodillo, Les Salines, and the Gonaïves Marshes. Lesser numbers were seen in mangrove swamps near Grand Goave, and at Lake Miragoane and the Artibonite Sloughs. Twelve were shot at Laguna del Salodillo on June 26. Two stomachs contained nothing but small seeds, mostly of grasses.

Dafila bahamensis bahamensis Linné. BAHAMA PINTAIL.—A pair was observed at Laguna del Salodillo on June 26; a flock of 30 at the Étang Bois-neuf on July 25; a few at the Artibonite Sloughs on July 28 and 29, where a male was collected on the 28th, and a dozen in the Gonaïves Marshes on July 30.

Erismatura jamaicensis jamaicensis Gmelin. WEST INDIAN RUDDY DUCK.—Three males were noted at Laguna del Salodillo on June 26, and one of them was collected. Its testes were much enlarged, indicating that it was a breeding bird. It agrees well in color and measurements with Porto Rican specimens. It shows the following measurements (expressed in millimeters): Culmen 42.5; Wing 132; Tarsus 33; Tail 77.5; Breadth of bill at widest part 23. Its stomach contained mainly seeds of *Persicaria*, and some unidentifiable vegetable debris. In addition it contained white quartz gravel to the extent of 40 per cent of the total contents.

Accipiter striatus striatus Vieillot. DOMINICAN SHARPSHINNED

HAWK.—Mathews saw one in the pine forest at La Vega on July 7, 1924 on a previous trip to the island.

Buteo borealis jamaicensis Gmelin. WEST INDIAN RED-TAILED HAWK.—Common at Petionville and Kenscoff July 23, and on the Citadelle Hill August 2; also seen at Monte Cristi June 27; San Pedro de Macoris July 7; Port-au-Prince July 14, and Gonave Island July 17.

Coryornis ridgwayi Cory. RIDGWAY'S HAWK.—Individuals seen east of Santo Domingo City on July 4 and 8, and at Haina on June 16. On July 18 on Gonave Island I observed three circling together over some lowland woods.

Falco sparverius dominicensis Gmelin. DOMINICAN SPARROW HAWK.—Common and generally distributed. Specimens collected at Haina, Monte Cristi, and on Gonave Island. A stomach from Haina contained nothing but grasshoppers.

Colinus virginianus Linné. BOB-WHITE.—Found to be quite common in the region west of Santo Domingo City. Also observed at Los Alcarrizos, Hato Mayor, Mirebelais, Grand Goave, and Fond des Negres. On June 30 at Los Alcarrizos a covey of five adults followed by a number of downy young was observed.

Numida galeata Pallas. GUINEA FOWL.—Common in the woods by the Yaquí River near Monte Cristi. They were usually seen in small flocks, at times on the ground, at others in the trees. They all took flight easily, though not excessively shy. A few were observed at La Vega, San Juan, L'Archahaie, St. Marc, and Les Salines.

Aramus pictus elucus Peters. LIMPKIN.—Limpkins were noted near mountain streams in the vicinity of Bonao and Villa Alta Gracia on August 7, where their loud, high-pitched, almost human-like note, which might be rendered *ca-wów-oo*, was heard during the moonlight night and at early dawn. At that time we were unsuccessful in sneaking up on the birds, but later my friend, Mr. Ermanno Ciferri of Bonao, sent me a fine female collected near that town on December 14, 1927.

Rallus longirostris vafer Wetmore. HAITIAN CLAPPER RAIL.—Common in the mangroves at Monte Cristi, Les Salines, and on Gonave Island. The stomach of a female collected at Monte Cristi on June 24 contained nothing but one fiddler crab (*Uca*).

Ionornis martinicus Linné. PURPLE GALLINULE.—A male was collected at Vázquez on June 25, and two were seen at Laguna del Salodillo on June 26. The stomach of the bird collected was empty except for some finely comminuted vegetable matter and some white quartz gravel.

Gallinula chloropus portoricensis Danforth. ANTILLEAN GALLINULE.—Common at suitable localities throughout the island. A pair was collected at Laguna del Salodillo on June 26. On July 3 a pair with four downy young were noted at a sinkhole pond at Los Tres Ojos de Agua, near Santo Domingo City, and on July 29 a nest with one egg was discovered at the Artibonite Sloughs. The specimens agree very closely with Porto Rican specimens in color and length of tarsus.

Fulica americana grenadensis Riley. WEST INDIAN COOT.—A pair observed on a small pond at Haina on June 16 were probably of this subspecies, as Jamaican birds have proved to be referable to this form.

Fulica caribaea subsp. CARIBBEAN COOT.—Fairly common; recorded from Laguna del Salodillo, Haina, Lake Miragoane, Artibonite Slough, and Gonaïves marshes. A breeding female was collected June 26 at Laguna del Salodillo, and a male July 28 at the Artibonite Sloughs. The stomach of the former contained 40 per cent grass; 44 per cent Persicaria seeds, and 16 per cent white quartz gravel. The female is much smaller than any of my specimens from Porto Rico, and shows the following measurements: Wing 172 millimeters; Tail 52; Culmen with frontal shield 51; Depth of bill at base 14.5; Length of frontal plate 21; Width of frontal plate 14.

Jacana spinosa violacea Cory. WEST INDIAN JACANA.—A few seen in fresh water ponds and marshes at Haina, Laguna del Salodillo, Lake Miragoane, and Gonaïves. A breeding male was collected at Laguna del Salodillo on June 26. Its stomach contained many finely comminuted insects, also white quartz gravel to the extent of 45 per cent of the contents.

Oedicnemus dominicensis Cory. DOMINICAN THICK-KNEE.—Mathews and Emlen believe they heard this species calling at night at Kenscoff on July 22. In 1924 Mathews saw an individual at La Vega which had been recently captured, and reports that on July 14, 1926, his brother, R. S. Mathews, saw one at night near Gonaïves, blinded by the glare of automobile headlights.

Charadrius semipalmatus Bonaparte. SEMIPALMATED PLOVER.—A flock of ten was observed at Monte Cristi on August 5.

Charadrius nivosus tenuirostris Lawrence. CUBAN SNOWY PLOVER.—A pair was observed at the Étang Bois-Neuf and the female collected on July 25. The ovary was large, indicating proximity to the breeding season. The notes might be rendered *cur-ee, cur-ee;* very different from any other Plover notes I know. The stomach of the bird collected contained three large black ants (*Odontomachus haematodes*), and two Corixid bugs.

Octhodromus wilsonius rufinuchus Ridgway. RUFOUS-NAPED PLOVER.—Common along the sandy beaches and in the mangrove swamps at Monte Cristi, where four specimens were collected; also on the extensive salt flats at Les Salines, and on Gonave Island, where four were collected. Two stomachs contained only fragments of Crustaceans.

Oxyechus vociferus rubidus Riley. ANTILLEAN KILLDEER.—Common and generally distributed. Definitely recorded at Higüey, Seybo, Hato Mayor, Haina, San Cristobal, Vázquez, Monte Cristi, Laguna del Salodillo, Dajabón, San Juan, Étang Bois-Neuf, Artibonite Sloughs, Les Salines, Gonaïves, Cayes, and Gonave Island. Collected at Haina and Vázquez.

Squatarola squatarola cynosurae Thayer and Bangs.—BLACK-BELLIED PLOVER.—A few observed at Monte Cristi June 24, 27, and

August 5; at St. Louis, Haiti, July 23, and Les Salines July 30; also at Anse-à-galets and Étroits, Gonave Island on July 17.

Arenaria interpres morinella Linné. RUDDY TURNSTONE.—Our only records were of 15 seen at Les Salines on July 30 and 5 at Monte Cristi on August 5.

Phaeopus hudsonicus Latham. HUDSONIAN CURLEW.—One was observed at Les Salines on July 30 by Emlen and myself.

Actitis macularia Linné. SPOTTED SANDPIPER.—Recorded at L'Arcahaie July 25; Les Salines July 30; Monte Cristi August 4 and 5, and Bonao August 7.

Tringa solitaria solitaria Wilson. SOLITARY SANDPIPER.—Two were seen at the Artibonite Sloughs on July 29.

Catoptrophorus semipalmatus semipalmatus Gmelin. WILLET.—Two were observed at Les Salines on July 30, and a female was collected. Its stomach contained nothing but fragments of Fiddler Crabs (*Uca*).

Totanus flavipes Gmelin. YELLOWLEGS.—About 100 were present at the Étang Bois-Neuf on July 25, and one was collected. Other records are: Artibonite Sloughs, July 28 and 29, six; Les Salines July 30, 100; Monte Cristi, August 4 and 5, three.

Totanus melanoleucus Gmelin. GREATER YELLOWLEGS.—Two were seen at Monte Cristi on June 24, 27 and August 5; six at Les Salines on July 30, one at Anse-à-galets on July 15, and twelve at Étroits on July 17.

Pisobia minutilla Vieillot. LEAST SANDPIPER.—Many were observed at the Étang Bois-Neuf on July 25, and a female collected. Other records are: Artibonite Sloughs July 29; Les Salines July 30 (common); Monte Cristi August 4 and 5. The stomach of the bird collected contained many small dipterous larvae; also two pieces of gravel.

Pisobia melanotos Vieillot. PECTORAL SANDPIPER.—Two were noted at Les Salines on July 30.

Ereunetes pusillus Linné. SEMIPALMATED SANDPIPER.—Many were observed at the Étang Bois-Neuf on July 25, and two were collected. Several were seen at Les Salines on July 30 and at Monte Cristi on August 5. A stomach contained some small black seeds and a little sand.

Himantopus mexicanus Müller. BLACK-NECKED STILT.—Very common at Laguna del Salodillo, Étang Bois-Neuf, the Artibonite Sloughs, Les Salines, and on Gonave Island. Pairs were found breeding at Haina and in the mangroves at Monte Cristi in June. One bird was noted at the medicinal sulphur springs near Port-au-Prince. Specimens were collected at Monte Cristi and Laguna del Salodillo. A stomach was nearly empty, but contained fragments of a moth and of a centipede, in addition to four pieces of white quartz gravel.

Larus atricilla atricilla Linné. LAUGHING GULL.—One noted in Santo Domingo Harbor June 14; two at San Pedro de Macoris July 4; a few in Port-au-Prince Harbor July 27, and six at Les Salines July 30. Mathews also reports seeing many off Mole St. Nicholas on July 27.

Gelochelidon nilotica aranea Wilson. GULL-BILLED TERN.—I observed four at Lake Miragoane on July 22; 25 at Les Salines on July 30, and five at Monte Cristi on August 5, where I collected a male. The stomach of this bird contained two hairy-legged crabs. So far as I am aware this species has not been previously recorded from the island. Emlen saw two pairs at Étroits, Gonave Island on July 17.

Sterna hirundo hirundo Linné. COMMON TERN.—This Tern was common off Saona Island on June 14, and Emlen noted about fifty at the same place on July 1.

Sterna albifrons antillarum Lesson. LEAST TERN.—Mathews discovered a small nesting colony on the beach at the mouth of the Yaquí River at Monte Cristi on June 25. The species was also observed at Les Salines on July 30, and off Saona Island on August 10.

Sterna fuscata fuscata Linné. SOOTY TERN.—Observed by Emlen at Puerto Plata on June 30 and off the east coast of Santo Domingo on July 1; and by Mathews off Saona Island on June 14 and off Mole St. Nicholas on July 27.

Thalasseus maximus maximus Boddaert. ROYAL TERN.—Observed in Santo Domingo Harbor June 14 and August 9; at San Pedro de Macorís July 4; Monte Cristi June 24 and August 5; Puerto Plata July 1 (Emlen); Gonave Island July 17 (Emlen).

Thalasseus sandvicensis acuflavidus Cabot. CABOT'S TERN.—Five observed at Monte Cristi on August 5. Mathews tells me that his brother, R. S. Mathews, saw six off Samaná Bay, with Royal Terns, on July 11, 1925.

Hydroprogne caspia Pallas. CASPIAN TERN.—Three noted at Les Salines on July 30.

Columba inornata inornata Vigors. HAITIAN BLUE PIGEON.—Five were observed in low woods near the mouth of the Artibonite River on July 29.

Columba leucocephala Linné. WHITE-CROWNED PIGEON.—Very common, in flocks, between Dajabón and Monte Cristi in June and August; also on Gonave Island, where specimens were collected. Many were seen at Seybo early in July, and lesser numbers at many other localities in both republics.

Columba squamosa Bonnaterre. SCALED PIGEON.—Very common on wooded hills near Bonao early in August. Our party shot ten, mostly immature birds with brown neck feathers. Mathews collected one at Laguna del Salodillo on June 26, and the species was observed at Seybo, La Vega, Citadelle Hill, Fond des Negres and on Gonave Island. Two stomachs contained palm nuts, and one had some small soft fleshy fruits with small seeds.

Zenaidura macroura macroura Linné. WEST INDIAN MOURNING DOVE.—Common. It was especially abundant in the vicinity of Monte Cristi, and along the road from Gonaïves to Cap Haïtien. Specimens were collected only at Monte Cristi.

Zenaida aurita zenaida Bonaparte. ZENAIDA DOVE.—Very common, and quite generally distributed in both republics, also on Gonave Island. Specimens were collected at Vázquez, San Juan, and on Gonave Island. This Dove was especially abundant in the mountains west of Azua.

Melopelia asiatica asiatica Linné. WHITE-WINGED DOVE.—The only place that this dove was found to be abundant was in the arid country around Monte Cristi, though it was also quite common in the dry country between St. Marc and Gonaïves, and on Gonave Island. A few were seen near Santo Domingo City, San Juan, Belladère, Port-au-Prince, Lake Miragoane, Aquin and Cayes. Specimens were collected near Monte Cristi and on Gonave Island. Their stomachs contained the seeds and pulp of some fruit with a bright red juice.

Chaemepelia passerina aflavida Palmer and Riley. HAITIAN GROUND DOVE.—Common at practically all localities visited, including Gonave Island. Specimens were collected at Monte Cristi and on Gonave Island. Near San Isidro Emlen timed one flying parallel to the car and found that it attained a speed of thirty-four miles an hour. The stomachs all contained small seeds.

Oreopeleia montana Linné. RUDDY QUAIL DOVE.—One was collected in dense woods at San Juan on July 11, and on August 7 five were seen and two collected on wooded hills near Bonao. On this date we also found a nest. It was a crude affair placed on some matted brush about one foot above the ground and contained two buffy eggs. On July 17 Mathews collected a male at Anse-à-galets, Gonave Island. The stomachs were very muscular, and contained considerable gravel in addition to their contents of fleshy fruits and their seeds.

Oreopeleia chrysia Bonaparte.—KEY WEST QUAIL DOVE.—Five observed and a female collected in heavily wooded country near San Juan on July 10; one seen in a coffee estate at Fond des Negres on July 23, and one collected in the wooded hills near Bonao on August 7.

Amazona ventralis Müller. HAITIAN PARROT.—Not so abundant as the paroquet, but we found it more generally distributed. They were especially common in the wooded hills near Bonao, where we collected three on August 7. They were also common in the regions between Azua and San Juan; between Navarete and Monte Cristi, and near the Artibonite Sloughs, where I collected one on July 29. Lesser numbers were observed at Seibo, Comendador and between St. Marc and Gonaïves. They were much shyer than the Paroquets.

Aratinga chloroptera chloroptera Souancé. SANTO DOMINGO PAROQUET.—The Paroquet was abundant in the region from San Juan, R. D. to Mirebalais, Haiti early in July. Thousands were seen every day during the time spent in this region, mostly in flocks of from ten to a hundred or more. At San Juan many large flocks flew over the town to the east every morning, and at evening returned to the west, always calling shrilly as they flew. During the daytime many small flocks were found in the woods feeding on the fruits of the cupey (*Ficus* sp.). At

such times they were very tame and unsuspicious and permitted of close approach. Even when a bird was shot from a flock the rest either did not fly at all or just moved to a nearby tree. We collected nine specimens in this region. None appeared to be breeding. We also found Paroquets fairly common near Bonao on August 7, and observed four and collected two at Laguna del Salodillo on June 26. Other observations were a flock of 20 at Hato Mayor on July 7, eight at Vázquez on August 6, and a few at Petionville on July 23. They are more noisy and have higher pitched notes than the parrots.

Coccyzus americanus americanus Linné. YELLOW-BILLED CUCKOO.—Uncommon on the main island; much more abundant on Gonave Island. Apparently nesting. Recorded at the following localities: Monte Cristi, June 22; Dajabón June 23 (male collected); Laguna del Salodillo June 26; Santo Domingo July 1; Vázquez August 6; Bonao August 7; Artibonite Sloughs July 29. Six were collected on Gonave July 15–19. Three stomachs from Gonave contained entirely animal matter, Noctuid caterpillars comprising 98.3 per cent of the total. The only other item found was an Elaterid beetle (*Monocrepidus* sp.). One stomach contained forty-five caterpillars, another fifteen, and the third ten.

Coccyzus minor teres Peters. DOMINICAN MANGROVE CUCKOO.—Not very common. Observed at Seibo (a breeding male collected July 4, and another observed carrying nest material July 5); at Vázquez (one collected June 25); at Monte Cristi June 18–27; at Bonao August 7; on the Citadelle Hill August 2; and at Lake Miragoane (one collected July 22). A few were seen and collected on Gonave Island the middle of July. A stomach from Gonave contained ten caterpillars of three species, two of them Noctuids. A stomach from Lake Miragoane contained ten Nymphalid caterpillars, identified by Dr. Carl Heinrich, of the U. S. Bureau of Entomology as Nymphalidae, probably *Caligo* sp. In addition this stomach contained a katydid, a mantid (*Callimantis antillarum*), two weevils (*Lachnopus* sp.), two wasps, and a stinkbug (*Nezara viridula*).

Saurothera longirostris longirostris Hermann. DOMINICAN LIZARD CUCKOO.—Common at all points visited on the main island. Three were collected at Monte Cristi and one at San Juan. On June 22 near Monte Cristi I collected a juvenile bird scarcely able to fly. A stomach from Monte Cristi contained two cockroach nymphs and two Cicadas (*Odopoea cincta*). Another contained an Anolis lizard, two large cicadas, and a small grasshopper (*Schistocerca* sp.).

Saurothera longirostris petersi Richmond and Swales. GONAVE LIZARD CUCKOO. This bird was not as common on Gonave as typical *longirostris* is on the main island. Mathews collected a male and two females there July 15–20, and noted that their habitat, actions and notes were similar to those of their mainland ally. A stomach contained an Anolis lizard, two Sphingid caterpillars (one of them *Celerio lineata*); three Noctuid caterpillars, a butterfly emerging from a chrysalis, and the wings of a damsel fly.

Hyetornis rufigularis Württemburg. HAITIAN HYETORNIS.—The only example seen was a male collected by Mathews in the hills above Anse-à-Galets, Gonave Island, on July 19. It was in dense woods at an altitude of about 700 feet. Its stomach contained lizard remains (92 per cent), and insect fragments, including Coleoptera (8 per cent).

Crotophaga ani Linné. ANI.—Common everywhere in the lowlands on the main island and on Gonave. Specimens were collected at Seibo, Monte Cristi, and Anse-à-Galets.

Temnotrogon roseigaster Vieillot. HAITIAN TROGON.—Although we did not actually see the Trogon, in the hills near Bonao on August 7 we heard what competent men assured us was the note of this species. It was a *krukk, krukk,* repeated many times.

Tyto glaucops Kaup. HAITIAN BARN OWL.—One was flushed from a limestone cave at Los Tres Ojos de Agua, east of Santo Domingo City on July 3; and one was heard in a garden at Port-au-Prince on July 14.

Speotyto floridana dominicensis Cory. HAITIAN BURROWING OWL.—Common in the dry region between Navarete and Monte Cristi. A few were seen at Santiago, Túbano, San Juan, Port-au-Prince, and Cayes. At Monte Cristi in June these owls were nesting in holes in dry clay banks at the edge of a mangrove swamp. A male and two females were collected there on June 23. One stomach contained only a little mouse fur, and another had Coleopterous fragments (95 per cent), and the claws of a centipede. Mathews describes their note as a not very loud *coó-kuk, kuk, kuk.*

Chordeiles minor gundlachii Lawrence. WEST INDIAN NIGHTHAWK.—Fairly common. Observed at Seibo, Hato Mayor, Santo Domingo, Los Alcarrizos, Bonao, Monte Cristi, San Juan and Cayes.

Streptoprocne zonaris melanotis Peters. HAITIAN COLLARED SWIFT.—Quite common at Bonao in June and August. Several were seen in the pine woods at La Vega on June 29 and 30. At San Juan on July 10 and 11 perhaps 200 were seen in a large mixed flock of Swifts. Several were seen at Comendador, R. D., and Las Cahobas, Haiti on July 12, and on the Citadelle Hill on August 2 and 3.

Nephoecetes niger niger Gmelin. WEST INDIAN BLACK SWIFT.—A few seen at Santo Domingo City in June and July, and many at Bonao in July and August. Common at San Juan July 10 and 11. A few seen at Haina and La Vega in June. Usually seen flying around after showers.

Tachornis phoenicobia phoenicobia Gosse. PALM SWIFT.—Locally common throughout the main island.

Mellisuga catharinae Sallé. HAITIAN BEE HUMMINGBIRD.—This diminutive Hummer was apparently rather scarce on the main island, where it was observed at Santo Domingo City, Bonao, La Vega, Cavaillon, St. Marc, and Fond des Negres. On Gonave Island it was much commoner. One was collected at Santo Domingo, and four on Gonave. The note was a very loud, metallic *screek, screek.*

Riccordia swainsonii Lesson. SWAINSON'S HUMMER.—Common on

Citadelle Hill August 2 and 3. A few were seen at Hato Mayor, Bonao, Petionville (1 collected), and on Gonave Island (1 collected).

Anthracothorax dominicus Linné. DOMINICAN MANGO.—Common at practically all points visited, both on the main island and on Gonave. They fairly swarmed in the tree cactus country near Gonaïves. On July 19 on Gonave Island a nest was found, built twenty feet from the ground on a fairly large branch of a prickly leguminous tree. It contained two eggs. Specimens were collected at Santo Domingo, Monte Cristi, Laguna del Salodillo, La Vega, San Juan, Aquin, and on Gonave Island.

Todus subulatus Gray. HAITIAN TODY.—An abundant bird on the main island and on Gonave. A female collected at Santo Domingo on June 17 had an egg with the shell fully formed ready to deposit. On July 18 a nest was discovered on Gonave Island. It was in a low white clay bank not over 8 inches in height beside a much used footpath. The hole was a tunnel about 9 inches long with only a slight turn in its direction, so that with the aid of a flashlight the incubating bird could be observed. The note was a high-pitched *zeep, zeep.* Two specimens were collected at Santo Domingo, three at Seybo, four at Monte Cristi, one at San Juan, and five on Gonave. A stomach from San Juan contained an Attid spider, a small millipede, two ants (including *Cryptocerus haemorrhoidalis*), a Chrysomelid beetle (*Cryptocephalus*), and a Coreid bug (*Catorhintha guttata*). One from Monte Cristi contained fragments of moths and beetles, and one from Gonave three caterpillars and some small beetles.

Todus angustirostris Lafresnaye. NARROW-BILLED TODY.—The only example actually collected of this species was a male which I obtained in a coffee plantation at Fond des Negres on July 23. Its stomach contained a small green fly with red eyes, and a small brown beetle.

Chryserpes striatus Müller. HAITIAN WOODPECKER.—An abundant species on the mainland, but we saw none on Gonave Island. All that we collected were parasitized with roundworms. On June 20 one was observed feeding young in a nesthole in an organpipe cactus, and near Gonaïves on July 31 young were heard calling from a similarly situated nesthole. Specimens were collected at Seibo, Santo Domingo, and Monte Cristi.

Nesoctites micromegas micromegas Sundevall. HAITIAN PICULET.—Locally common in woods near the Yaquí River in the vicinity of Monte Cristi, and in the savanna woods near Seibo. A few were also observed at Bonao, Laguna del Salodillo, east of Azua, and on the Citadelle Hill. They were generally found in pairs, and were not very shy. On July 4 at Seibo a female was observed boring a hole in a partly rotted fence post, but on collecting her the ovary was found to be rather small. Two were collected at Monte Cristi and five at Seibo. A stomach from Monte Cristi contained entirely animal matter (a centipede, many ants, including a soldier of *Pheidole megacephala*, three earwigs, and the elytra of many small beetles). The call note is a rolling trill with a deep flycatcher-like

tone resembling somewhat that of *Tolmarchus taylori*. It might be rendered *tut, tut, tut, tut, tut wheár*.

Nesoctites micromegas abbotti Wetmore. GONAVE PICULET.—Much more common on Gonave than its very similar mainland ally is on the main island. It is almost abundant in the brushy woods, and its characteristic call note is heard on every side. We collected five specimens. The stomach contents of one consisted exclusively of the seeds and pulp of some fruit with a bright orange pulp.

Tyrannus dominicensis dominicensis Gmelin. GRAY KINGBIRD.—Common everywhere; collected at Seibo, Monte Cristi and Gonave Island. Nesting on Gonave the middle of July. A stomach from Gonave had 10 seeds of a fleshy fruit amounting to 60 per cent of the contents; also a cicada, a Membracid (*Orthobelus urus*), a fly, and a small beetle.

Tolmarchus gabbii Lawrence. HAITIAN PETCHARY.—Rather scarce and local in its distribution. Recorded near Santiago on June 18; at Vázquez (one collected June 25); at Monte Cristi (one collected June 20); Azua on July 9; San Juan (one collected July 10, and one seen the 11th); and at Fond des Negres (one collected in a coffee plantation July 23). A stomach from Vázquez contained five Coccinelid beetles (*Daulis ferruginea*), and a wasp (*Pachyodyneurus nasidens*). One from Fond des Negres contained an Elaterid beetle (*Monocrepidius*), a Coccinellid (*Daulis ferruginea*), two Chrysomelids (*Colaspis chevrolati*), and a seed.

Myiarchus dominicensis Bryant. HAITIAN FLYCATCHER.—Common in the region from Santiago to Monte Cristi, and abundant near the mouth of the Artibonite River. Also observed at Seibo, Santo Domingo, San Juan and Lake Miragoane. Fairly common on Gonave Island. One collected at Seibo, one at Santo Domingo, five at Monte Cristi, and seven on Gonave. On June 23 west of Monte Cristi a juvenile bird just out of the nest was collected. The note of this species is a *whee* similar to that of *M. antillarum* but fainter and less vigorous. A stomach from Gonave contained ten weevils (*Lachnopus*) and a butterfly; another a seed, three caterpillars, and a small Chrysomelid beetle. A stomach from Monte Cristi contained only a few solanaceous seeds; another an *Erax rufitibia* and some beetle remains, and a third a small black Buprestid beetle, a weevil (*Lachnopus*), a grasshopper (*Schistocercus*), and an Asilid fly (*Erax rufitibia*) in addition to some unidentifiable animal matter.

Blacicus hispaniolensis Bryant. HAITIAN PEWEE.—We found the Pewee rather scarce. Two were collected at Seibo July 4–6, and a few were seen at Santo Domingo and San Juan, where one was collected on July 11. On Gonave it was somewhat commoner, and we collected three. The note was quite similar to that of *B. blancoi* of Porto Rico. A stomach from Gonave contained a moth, a wasp (*Chalcis inserta*), and a small beetle.

Lawrencia nana Lawrence.—Fairly common on Gonave Island, but we found none on the mainland. Mathews collected a male at Anse-à-Galets on July 20. It was perched on top of a bush, calling with a fairly loud, unmusical trill.

Progne dominicensis Gmelin. CARIBBEAN MARTIN.—Quite generally distributed in small numbers. Observed at Higüey, Santo Domingo, Monte Cristi, Laguna del Salodillo, Comendador, Grand Goave, Aquin, Cayes, and Cap Haïtien.

Petrochelidon fulva fulva Vieillot. HAITIAN CLIFF SWALLOW.—Observed at most places visited. In June and July a colony of about twenty-five pairs was nesting in an inaccessible place on a ledge in an overhanging cliff over the sea at Santo Domingo. They had young the first week in July. On August 2 and 3 we observed large numbers nesting in the ruins of the Citadelle. Many were flying over the mangrove swamps on Gonave Island, where we collected five, all immature, on July 18–20. A stomach contained many comminuted small beetles, a bug, and part of a snail shell.

Corvus palmarum Württemburg. LESSER HAITIAN CROW.—Common in the dry brushy region between Monte Cristi and Navarete. They were not shy, and were very easy to collect. They occurred in flocks, and were molting badly the latter part of June. Their caw was much like that of *C. brachyrhynchos*, but higher pitched, not so loud, and with a sort of burring, nasal quality. They were also common in the rolling, hilly, rather sparsely vegetated country between Las Matas, R. D., and Mirebalais, Haiti; in the vicinity of St. Marc and the Artibonite river sloughs, and in the tree cactus country east of Gonaïves. There they were particularly tame and curious, and could easily be photographed with a hand camera. They were also fairly common in xerophytic forests near Port-au-Prince. Dr. Wolcott tells me he has seen them eating and flying away carrying Sphinx caterpillars (*Celerio lineata*) from the cotton and sisal plantation at Hatte Lathan. Three specimens were collected near Monte Cristi, and one at Vázquez. Three stomachs contained lizards (20 per cent); snails (5 per cent); Coleoptera (6 per cent; including *Prepodes, Calosoma* and others); miscellaneous insects (3 per cent; caterpillars, a cicada, and Hemipterous fragments); fruit pulp (17 per cent); seeds (23 per cent); grass (5 per cent); stones (21 per cent).

Corvus leucognaphalus Daudin. HAITIAN CROW.—A few seen at Bonao, in the pine woods at La Vega, between Port-au-Prince and St. Marc, and one on Gonave Island (July 15). At Las Cahobas we found a dozen in a river valley in the same trees with *C. palmarum*, and we collected two females. One had a bright red iris, the other a yellow one. Their notes were a most uncrowlike, guttural sound.

Mimus polyglottos dominicus Linné. DOMINICAN MOCKINGBIRD.—Abundant at all points visited on the main island and on Gonave. Observed feeding young in nest at Monte Cristi on June 22. On Gonave on July 16 a nest with two eggs and a new-hatched young was found, and on July 18 a nest with large young and another with four eggs. The eggs were blue with large brown spots. Most of the nests found were in acacia trees, though one was in a scrubby mangrove. Specimens were collected at Seibo, Monte Cristi, and on Gonave Island. Two stomachs from Gonave contained nothing but the pulp and seeds of fruits.

Mimocichla ardosiacea ardosiacea Vieillot. HAITIAN THRUSH.—Fairly common in wooded country on the main island, much scarcer on Gonave. Observed at Seibo, Santo Domingo, Los Alcarrizos, Bonao, La Vega, Monte Cristi, Fond des Negres, and Citadelle Hill. The Haitian natives call this bird the "*pi-pi-weet.*" An adult accompanied by young on the wing was observed on Gonave on July 18. A stomach from San Juan contained a seed and two cockroaches, one of them being recognizable as *Epilampra saublosa*. A stomach from Gonave contained four seeds, a snail, a Lamellicorn beetle (*Lachnosterna hogradi*), and a millipede.

Dulus dominicus Linné. PALM CHAT.—An abundant and gregarious species everywhere on the main island where there are Royal Palms, for them to nest in. Sometimes they nest in other palms, as at Le Trou. Their large nests form conspicuous objects. A flock of Palm Chats produce a sound not unsimilar to that of English Sparrows. Not observed on Gonave Island. Specimens collected only at Santo Domingo and Haina. A stomach contained only large seeded fruits, apparently palm berries.

Vireo olivaceus olivaceus Linné. JAMAICAN VIREO.—Abundant and generally distributed both on the main island and on Gonave, but the Gonave birds sang quite a different song. Mathews describes it as "a two or three phase vireo-like whistle, but with the accent on the beginning of each phrase, *'wheé-tu-lu, wheé-tulu, whéar'*," instead of the ordinary *julian-chivi* or *whip-tom-kelly* of the main island bird. Numerous nests with from 1 to 3 eggs were found on Gonave July 15–20, at heights of from five to nine feet above the ground. The nests were very similar to those of the Red-eyed Vireo. Specimens were collected at Seibo, Haina, Bonao, San Juan and on Gonave. A stomach from Bonao contained entirely vegetable matter (fruit fibers and small seeds). Two from Gonave contained 72.5 per cent vegetable matter (small drupes and seeds) and 27.5 per cent animal matter, including two beetles (one of them *Lachnopus*), two caterpillars, and the pupa of a moth.

Coereba bananivora Gmelin. HAITIAN HONEY CREEPER.—Widely distributed, but nowhere abundant. Observed at Seibo, Hato Mayor, east of Santo Domingo City, Bonao, La Vega, Monte Cristi, Laguna del Salodillo, San Juan, Las Cahobas, Fond des Negres (quite common in coffee plantations), and on Citadelle Hill. They were somewhat commoner on Gonave, where a nest with one egg was found six feet from the ground in a shrubby tree on July 17. Specimens were collected at Hato Mayor, San Juan, and on Gonave.

Dendroica petechia albicollis Gmelin. DOMINICAN GOLDEN WARBLER.—Fairly common in the mangroves at Monte Cristi, and in a dry creekbed near the sea between Monte Cristi and Dajabón. A few seen at Port-au-Prince, and common in the mangroves at Les Salines, and on Gonave, where young were on the wing at the time of our visit. Three were collected at Monte Cristi and eight on Gonave. A stomach from Monte Cristi contained a Dolichopodid fly, a green fly, and a green wasp.

Five from Gonave contained entirely animal matter. Caterpillars, mostly Nymphalid, formed 32 per cent; Coleoptera 30 per cent (largely Chrysomelidae, among which *Epitrix cucumeris* was recognized); an ant-lion emerging from the cocoon 8 per cent; Diptera 14 per cent, including fragments of a large Syophid fly, *Volucella obesa;* and Hymenoptera 4 per cent (a black wasp and an ant). Bits of lizard skin were found in two stomachs.

Dendroica pinus chrysoleuca Griscom. HAITIAN PINE WARBLER.—Observed in the pine woods near La Vega on June 29 and 30. One was shot, but could not be recovered in the thick undergrowth.

Hyphantornis cucullatus (Swainson). HOODED WEAVER.—This Weaver-bird seems to have become well established at many points in Haiti. On July 14 a nesting colony was observed and photographed in Royal Palms on the Brigade Hospital Grounds in Port-au-Prince. The nests were globular structures suspended from the undersides of the palm leaves. A small colony was also noted in a leguminous tree on the sisal plantation of the Service Technique, and five colonies on the road to St. Marc, in low trees over the edge of the sea. At the Artibonite Sloughs there was a nesting colony in some trees growing in the water, and the birds were quite common in that vicinity. A few were also seen south of Gonaïves, but no nests observed there. Their song was loud and wheezy. Specimens were collected south of St. Marc, and at the Artibonite Sloughs.

Agelaius quisqueyensis Danforth and Emlen. HAITIAN REDWING.—This bird we found only in the vicinity of the Artibonite Sloughs, where we saw about twenty on July 29. Some were feeding young on the wing. We collected two males and three females. Seeds could be distinguished in their stomach contents, but otherwise the food was too finely comminuted for making satisfactory determinations.

Icterus dominicensis Linné. DOMINICAN ORIOLE.—Fairly common and generally distributed on the main island. Two females were collected at Vázquez on June 25. A stomach contained only insects, mostly too much comminuted for identification, but a *Catorhintha guttula* and a *Cryptocephalus* were recognized.

Holoquiscalus niger niger Boddaert. HAITIAN GRACKLE.—Locally common on the main island, but absent on Gonave. Recorded at Seibo, Hato Mayor, San Pedro de Macorís, Santo Domingo (rare), Haina, Bonao (collected), La Vega, Vázquez, Monte Cristi (common along the beach east of the town; specimens collected); Laguna del Salodillo, San Juan, Port-au-Prince, Kenscoff, Lake Miragoane, Fond des Negres, Artibonite Sloughs, and Gonaïves. A colony of six pairs was found nesting in trees over the Artibonite Sloughs on July 29. One nest had two eggs, while the others contained young. A stomach from Bonao contained an Anolis lizard and four seeds. One from Monte Cristi contained a lizard, four Otiorhynchid beetles (*Lachnopus*), an Elaterid (*Monocrepidius*), and a cricket (*Gryllus assimilis*).

Phaenicophilus palmarum Linné.—This was one of the most abund-

ant birds on the main island, both in moist and dry regions, but we did not find it on Gonave. They make a great variety of harsh and metallic sounds, one of which sounds much like the call note of a Song Sparrow. Specimens were collected at Seibo, Santo Domingo, Haina, Monte Cristi, and San Juan. Five stomachs contained 69.4 per cent vegetable matter and 30.6 per cent animal matter. Three stomachs contained nothing but seeds and drupes, and these occurred in smaller quantities in the other two stomachs. The animal matter consisted of insects, among which a large brown tree cricket, a small green katydid, a Bibionid fly, a wasp, and a Coreid bug (*Catorhintha guttula*) were recognized.

Phaenicophilus poliocephalus coryi Richmond and Swales.—This form was common on Gonave Island, in thick underbrush near the ground. Adults were observed feeding young on July 17. We collected 13 specimens. The contents of five stomachs were examined, and found to contain 95 per cent animal and 5 per cent vegetable matter, the latter consisting of seeds in two stomachs. Orthoptera formed 12 per cent (a large cockroach nymph); Lepidopterous larvae 45 per cent, (mostly Noctuids, in 4 stomachs); Hemiptera 8 per cent (nymphs of Pentatomidae and Membracidae); and Coleoptera 28 per cent. These were mostly Tenebrionidae, among which a *Hymenorus* sp. was recognized. *Lachmopus* weevils were found in three stomachs and formed 11 per cent, and an Elaterid in one and Carabids in one, two snails in one stomach formed 2 per cent.

Calyptophilus frugivorus abbotti Richmond and Swales.—Probably not uncommon on Gonave, but rather difficult to observe on account of the dense undergrowth in which they live, though they were not especially shy. Their song was a rather buzzy, whistled "*wee-chee-chee-chee-chee.*" I collected two males. Parasitic nematodes were found under the skin of the breast and belly of one of them. Their stomachs contained 10 per cent vegetable matter (two seeds in one stomach), and 90 per cent animal matter (a moth; an ant, *Pheidole megacephala;* two hairy spiders, a thrips, and the oötheca of a cockroach).

Tiaris olivacea olivacea Gmelin. YELLOW-FACED GRASSQUIT.—Abundant everywhere except in arid country on the main island. Not particularly abundant on Gonave. At Hato Mayor on July 7 we observed a nest a foot above the ground in a small bush. The five eggs were spotted with red, especially at the larger end. On July 17 on Gonave we found another nest four inches above the ground concealed in a small rounded shrub the leaves of which possessed hairs with decidedly poisonous qualities. This nest contained four eggs. Specimens of this bird were collected at Santo Domingo, Bonao, and on Gonave. Stomachs contained nothing but small seeds.

Tiaris bicolor marchii Baird. BLACK-FACED GRASSQUIT.—Decidedly less common than the Black-faced species. A few were observed at Santo Domingo City (collected), Haina, Bonao, Las Matas, St. Marc, Gonaïves, Cap Haïtien, Citadelle Hill, and on Gonave (collected). Stomachs contained nothing but small seeds.

Pyrrhulagra violacea affinis Baird. HAITIAN GROSBEAK.—Fairly common in thick brush, close to the ground, both on the main island, and on Gonave. On July 17 at Étroits, Gonave Island, Emlen found and photographed a nest. It was a domed affair, placed three feet from the ground in an open bush, and contained four white eggs spotted with brown, especially at the larger end. Specimens of this bird were collected at Santo Domingo, Haina, and on Gonave.

Ammodramus savannarum intricatus Hartert. SANTO DOMINGO GRASSHOPPER SPARROW.—Common and singing in grassy field alternating with woodland patches at Hato Mayor on July 4–7. A few flew up as though they had nests, but these could not be located. We collected two females and a male on July 7. Two were seen between Belladère and Las Cahobas on July 12.

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GENERAL NOTES.

Second Ontario Record for Fulmarus glacialis glacialis.—The Royal Ontario Museum of Zoology has recently received a specimen of Fulmar from Mr. Oliver Trafford, taxidermist at St. Eugene, Ontario. Mr. Trafford's remarks concerning the specimen were that it was "picked up on the shore of the Ottawa river above Pointe Fortune, Quebec, but in Ontario, about one half mile above the Provincial boundary." This was on November 15, 1928. He further states that the bird was examined while being skinned, that it was very emaciated and there were no bruises or signs of shot.

This specimen, R. O. M. Z. No. 29, 2, 27, 1, is the second to be recorded from Ontario. The first, taken at Arnprior, Ontario, also on the Ottawa river, was recorded by Gormley (Auk, XLI, No. 3, pp. 470–471) and is now in the collection of the National Museum of Canada.—L. L. Snyder, *Royal Ontario Museum of Zoology, Toronto.*

A Second Topotype of Campephilus principalis.—In examining the series of Ivory-billed Woodpeckers in the collection of Dr. L. C. Sanford, which forms part of that of the American Museum of Natural History, I have noted a very handsome adult male, taken at Cheraw, South Carolina, April 6, 1876. Cheraw is near the Pee Dee River, and is the locality referred to by Wayne (1910, Birds of South Carolina, p. 87) as that in which Ivory-bills were observed during 1889.

In the same publication, Wayne refers to two specimens presented to the Charleston Museum in 1860. The only Carolina bird hitherto known to be still preserved, however, is a skin presented to the Charleston Museum by Dr. Thomas Barbour, during the A. O. U. meeting of 1928. If this be correct, Dr. Sanford's specimen is the second that may be called a topotype.—Robert Cushman Murphy, *Amer. Mus. Nat. Hist., New York.*

Little Gull (Larus minutus) at Port Newark, N. J.—Messrs. James L. Edwards, John Thompson and the writer closed our "big day" in Essex County on the Port Newark Meadows, on May 12, with the first New Jersey record of the Little Gull of Europe, an adult in spring plumage.

Finding the rain of an approaching thunder storm close upon us we hurried to the bulkheads along the bay to look over the Gulls congregated on the vast mud flats which were exposed by the low tide. In a mixed flock of about 200 Bonaparte's Gulls, fifty Ring-bills and a dozen Herring Gulls we picked out two birds with black heads. One of these showed black under wings, the other was an adult Bonaparte's Gull. By watching them carefully in flight, on the water and as they alighted on the flat, we noted clearly all the field markings of this unusual visitor at a distance of about one hundred yards.

As the rain hit the birds on the flat they flew up with loud cries, circled about and alighted on the water before us. As the storm cleared and a rainbow appeared, the wind freshened, the evening sun came out and the Gulls splashed in the water, flying up a few at a time into the wind and returning again to the mud flat. We had an unparalleled view of all the species and saw the European immigrant to our entire satisfaction. It fluttered its wings like a Tern and was several times an object of attack by the many Bonaparte's Gulls.

In size it was about two inches shorter than the latter and markedly smaller when they were seen side by side. The color of the under surface of the wings looked absolutely black and the upper side was apparently not marked at all; the body, tail and back were white; head and neck, black. When alighting, the ends of the primaries seemed to be black with white tips, but in talking this feature over with Mr. John T. Nichols, he said that some of the dark gray under surface must have shown when in this position. The bill seemed to be red and the plumage of the under surface looked slightly rosy.—Warren F. Eaton, *63 Normal Avenue, Upper Montclair, N. J.*[1]

Larus minutus seen in Upper New York Bay.[1]—Towards 7:50 A.M. on May 6, 1929, I stood near the bow of a Staten Island ferryboat, passing along the west side of Governor's Island. For some minutes I had been watching a party of about fifteen Bonaparte's Gulls, of which only two appeared to be in adult breeding plumage. Now it became evident that there were three black-headed birds, and I turned my field-glass on one that happened to be offering a splendid broadside view within about two hundred feet.

The morning sun behind me rendered visible a light pink blush on the bird's breast such as I had never been able to see in a Bonaparte's Gull until I actually held the bird in my hands. Next I began to notice that the usual white patch on the upper surface of the primaries was lacking, and instead the whole upper surface of the wing was light bluish gray, with only a white border along its whole posterior margin. The black tips of the primaries, conspicuous in Bonaparte's Gull, were lacking, and the whole bird looked a trifle small, if anything, for a Bonaparte's Gull.

At such close range no other bird was visible in the field of the glass, so I turned it toward one of the adult Bonaparte's Gulls, and verified the familiar markings of that species. By this time the other bird, which I had decided must be the Little Gull of Europe, had passed out of sight.

If I relate the circumstances of the observation in detail, and seem to be repeating what one may find in published descriptions of the birds, it is simply because on this evidence the identification must be judged. I regret that I did not note the relative size or the color of the bill; and I may add that I have never seen the Little Gull alive in Europe, nor have I had occasion for some years to study specimens or descriptions of it.

[1] Published by the Dwight Memorial Fund.

While I have confidence in the points I have enumerated, I can only offer the observation for what it is: a sight record under unusually favorable conditions.—JAMES P. CHAPIN, *American Museum of Natural History, New York.*

Greater Snow Goose on Long Island, N. Y.—The Snow Goose (*Chen hyperboreus*) is such a rare bird along the Atlantic coast north of Delaware Bay, especially in Spring, that a summary of its recorded occurrences on Long Island, New York, and in the New York City region during the northward migration may be of interest.

Giraud, in his 'Birds of Long Island' (1844), says of "*Anser hyperboreus:*" "With us, the occurrence of this bird is not frequent. Occasionally the young are seen exposed for sale in the New York markets, though rarely the adult. In some seasons, small parties are seen on the South Bay, and now and then stragglers are seen flying in company with the Canada Geese." He does not state in which "seasons" they are seen. Braislin, in his 'List of the Birds of Long Island, New York,' (Abst. Proc. Linn. Soc. N. Y. Nos. 17–19, 1907), speaks of the Greater Snow Goose (*Chen hyperboreus nivalis*) as a "rare autumnal migrant" and mentions four autumn and winter records. Eaton, in 'Birds of New York' (1910) gives eleven records for the subspecies *nivalis* on Long Island, only one of these being in spring (Shelter Island, April 3, 1889. One male, Dutcher). He also speaks of Fisher's observation of several hundred birds, presumably of the same subspecies, on the Hudson River at Ossining, N. Y., April 8, 1882 (Bull. N. O. C., VII, p. 251).

On April 15, 1917, the writer had the unexpected pleasure of seeing a flock of at least twenty-five Snow Geese (subsp. ?) migrating northeastward over Long Beach, Nassau County, Long Island. The sight of these large white birds with black wing-tips against a background of alternating blue sky and dark strato-cumulus clouds rolling out of the northwest, combined with the high-pitched "honking" of the flock, left an impression which is still vivid in his memory after a lapse of twelve years. This record, and one by Mr. Roy Latham for Orient, April 17, 1919, are to be found in Griscom's 'Birds of the New York City Region' (1923) and constitute, apparently, the second and third (and, to date, the last) published spring records for the species on Long Island.

Recent observations of Snow Geese in the New York City region are as follows:—Messrs. T. Donald Carter and F. E. Watson saw a flock of thirty-seven flying north over the Jersey City Reservoir at Boonton, Morris County, N. J., April 6, 1924 (Auk, Vol. XLI, p. 472).

On April 11, 1926, Messrs. R. R. Coles and De L. F. Johnson found one individual on Long Island Sound off Sound Beach, Conn. (Auk, Vol. XLIII, p. 363). Mr. John R. Kuerzi has reported seeing one bird on Staten Island, N. Y., April 17, 1926, and Mr. Allan D. Cruickshank saw two flying up the Hudson River near Yonkers, N. Y., March 9, 1929. (These last two observations will be published in a forthcoming Abst. Proc. Linn. Soc. N. Y.).

Although the subspecies *nivalis* is supposed to be the one occuring on the Atlantic coast, two specimens of *C. h. hyperboreus* have been taken on Long Island and also one near Elizabeth, N. J. (Auk, Vol. XXXVIII, p. 120. Charles A. Urner),—all three in the month of October. Mr. G. A. Langelier, in 'The Auk' for January, 1929, p. 103, reports a bird he shot on the north shore of the St. Lawrence River, in Quebec, on May 14, 1928, identified by Mr. Frederic H. Kennard as *C. h. hyperboreus*. This bird, presumably, migrated north along or near the Atlantic coast.—E. R. P. Janvrin, M.D., *38 East 85th Street, New York City.*

Migrating Ducks in the Valley of Virginia.—The 1929 spring migration of Ducks in Virginia, west of the Blue Ridge mountains, was of unusual interest. This mountainous region is not very attractive to Ducks. We have few large streams and no lakes of any size. Mallards and Black Ducks are regular fall and spring visitors in small numbers, and Blue-winged Teals and Lesser Scaups are nearly always seen in the migration periods. With these exceptions, there are only casual records of Ducks. This year a number of species occurred which have rarely been noted in this section. All of these herein reported, except the Baldpates, I saw on Cameron's Pond, a very small body of water two miles from Lexington, Va. Most of them were seen while in company with Mr. M. G. Lewis of Lexington.

The following species were observed:

Lophodytes cucullatus. Hooded Merganser.—Single females were seen on various dates from April 3 to 17.

Mareca americana. Baldpate.—I saw a flock of seven on North River, near Lexington, March 11.

Spatula clypeata. Shoveller.—A male and two females on March 23; two males and five females on March 31; a single male on April 1 and 3. All very wild.

Nyroca americana. Redhead.—One male stayed on the pond from March 20 to April 6.

Nyroca collaris. Ring-necked Duck.—One male from March 18, joined by another male on March 31, and both stayed until April 6. The Redhead and the Ringnecks were always together. They were very tame and rarely took flight even on being closely approached. One rainy day I drove my car out in the open to the edge of the pond and watched them. I saw the same trio once on North River where automobiles were passing on a much-travelled road within less than a hundred yards of them without frightening them away.

Glaucionetta clangula americana. American Goldeneye.—One found dead on March 18. Wing broken by shot. Had not been dead long, but was partially eaten by turtles. I saved the head, a wing, and the feet.

Charitonetta albeola. Bufflehead.—One female April 15 to 17, with an Old Squaw.

Clangula hyemalis. Old-squaw.—One male from April 14 to 17. The

molt into nuptial plumage almost complete, except for a whitish patch on crown and hind head and a number of white spots on back and shoulders. I have the skin. The Bufflehead and Old-squaw were noted just after a storm. They were quite tame and very active, diving constantly. On April 18 I found these two and a Lesser Scaup dead, floating in the rushes at the pond's edge. Someone had shot them, apparently with a small rifle.

A Florida Gallinule (*Gallinula chloropus cachinnans*) spent a week here on another pond, April 19 to 25.—JAMES J. MURRAY, *Lexington, Va.*

Nesting of the American Merganser in Chihuahua.[1]—In a general collection of bird skins recently acquired by Mr. Donald R. Dickey from H. H. Kimball, there is a downy young of *Mergus merganser americanus* Cassin, collected by Mr. Kimball at Colonio Pacheco, Chihuahua, Mexico, on May 23, 1909. The bird was not more than a couple of days old at the time of collection and therefore was certainly hatched in the immediate vicinity. As the southernmost breeding station recorded by Bent (U. S. Nat. Mus. Bull. 126, 1923, p. 12) is Tulare County, California, it seems desirable to place this downy young on record. In details of head coloration and in the position of nostril, which is 11 mm. from the tip and 8 mm. from the base of the exposed portion of the maxilla, the specimen is typical of this species.—A. J. VAN ROSSEM, *Pasadena, California.*

Florida Gallinule in Northern New Jersey.—April 29, 1929, in a big, fresh-water marsh near Whippany New Jersey, I observed a Florida Gallinule. I noted its call and heard several others like it in the marsh. I had heard these calls in the marsh since April 13, but, as I saw Coots, I took them for Coot calls, not being familiar with the calls of either bird.

May 1, I was again in the marsh, and observed two Gallinules through 8x glasses (Zeiss) within thirty yards, with Coots close by for comparison. But, surely, no careful observer would ever confuse the two. I saw four others at a distance, and from the calls in the marsh, I would say that I did not see half the Gallinules that were there.

I expect to keep watch on the Gallinules to see if they breed there this season.

The marsh has had unusually high water all the spring. Shovellers and Blue-wing Teals have been quite common up to April 27.

I have haunted this marsh winter and spring for seven years, and this is the first time I have observed there Florida Gallinules, Coots or Grebes (Pied-bill?).—W. DAN QUATTLEBAUM, *East Orange, New Jersey.*

Egg-eating Habits of the Florida Gallinule.—In 'The Auk' Vol. XLIV, page 550, October, 1927, I noticed an article by Alfred M. Bailey, giving an interesting and unique account of a Purple Gallinule stealing a very small young of the Louisiana Heron, from a low nest in the swamps

[1] Contribution from the California Institute of Technology.

of lower Louisiana. He stated that he actually saw the bird pick up the young Heron by the neck and dart off with it.

During the summer of 1928 either in late June or the early part of July Mr. Joseph Howell, of Orlando, Florida, told me of a nearly parallel case. He was hunting for late nests of the Florida and Purple Gallinules on the west side of Lake Apokpa in Lake Co., Florida. While standing quietly watching for birds he noticed a Florida Gallinule go to a Purple Gallinule's nest and pick up something and as it rose and flew past near him, he said he could see that the bird had stuck its bill through an egg and was carrying it in that manner.—DONALD J. NICHOLSON, *Orlando, Florida.*

Notes on the Roseate Spoonbill (Ajaia ajaja) in Florida.—A Roseate Spoonbill has always been a sort of Will-o-the-wisp, to me, and although I have been to most of the places where it has been reported to me I have yet to see one in its native habitat. The following reports covering recent years may be of interest.

Mr. A. M. Nicholson, a reliable observer, informed me that he had found a few pairs of Roseate Spoonbills nesting among a colony of White Ibis, on Bird Island, Lake Kissimmee, Osceola County, Florida. This was either during the early nineties or late eighties. At one time this was a famous rookery, but as early as 1908, few breeding birds were to be found upon the island; only such birds as Ward's Herons, several pair of Black-crowned Night Herons, Florida Ducks, and a colony of Stilts. In April, 1909, a single pair of Glossy Ibises nested on the island, and a set of two fresh eggs and the parent birds were secured by Gilbert R. Rossignol, Jr.

A trapper by the name of Henry Redding, has told me of the Spoonbill breeding at the mouth of Wolf Creek, Osceola Co., Florida, in a marsh which is part of the St. Johns River system. He was corroborated in his statement by a woodsman, Edw. Murphy, who also had occasion to visit this heronry.

There were no eggs taken, and they might have presumed the birds nested as they were associating with the numerous Herons and Ibises which were nesting. They both declared that they had seen Roseate Spoonbills at this place in different years.

These men also stated they had seen this species in numbers in the Mosquito Lagoon, at the Haulover Canal, near Oak Hill, and thought they were nesting there. This was within the last several years.

Benj. Reddit, an old reliable resident of Orange County, told me of seeing two or three Spoonbills feeding on the Indian River, near Cocoa, Brevard County, in June 1923, or 1924.

While riding with the late William Leon Dawson, in March 1927, through the wildest part of Okeechobee County, returning from a Wood Ibis colony we had been photographing in Blue Cypress Lake, we came upon an intelligent Seminole Indian who told us that the Roseates nested at Fish-eating Lake, south of La Belle, Hendry County. This coincided with information received from several Indians that I questioned while

camped near Everglade, Collier County, in March, 1928. They vowed that they nested in practically the same locality and still nested there. I took a trip with one Indian who volunteered as a guide and took me straight to a spot where they had nested in recent years, but the water was low and practically all dried up, and no birds were found.

My brother-in-law, Captain Chas. Lockwood, who pilots parties of tourists on fishing excursions, has told me of seeing many "Pink Curlews" flying to roost on Pavillion Key, Ten Thousand Islands, late in the evening. This was six or eight years ago.

The latest record that I have of nesting Spoonbills, was in March, 1928, in Palm Beach County, by Henry Redding. He stated he found them while on a surveying party, nesting on a small Lake, where also were a few breeding Everglade Kites. He took the pains to write and tell me this, knowing that I was especially interested in such records. No specimens were collected.

Twelve years ago they nested on the edge of the Everglades on the southeast side of Lake Okeechobee, some miles below Eupotia. This I gathered from an old resident of that place, named Carl Barber. He knew the birds well and had seen them nesting there. This information was given me in 1922.

A trip to Cape Sable in April 1927, in company with William Leon Dawson, on purpose to see these birds, resulted in failure. I was also at Shark River in March, 1928, and remained in that vicinity for two weeks in March and one week the first part of May, but saw none of the birds.—Donald J. Nicholson, *Orlando, Florida.*

Early Date for Solitary Sandpiper.—I wish to report an apparently early date for the Solitary Sandpiper (*Helodromas solitarius*). A single specimen frequented a small fresh water pond with trees growing to the water's edge on the east boundary of Pelham Bay Park, N. Y., near Long Island Sound, and was seen three times, a week apart—Sunday, April 7, 1929; Sunday, April 14 and again on the 21st. It was undoubtedly the same bird as it did not leave the pond but flew only from one shore to another when disturbed. All of these dates appear very early, according to Griscom's 'Birds of New York City Region,' Chapman's 'Birds Eastern N. A.' and Eaton's 'Birds of New York State.' As it was tame I had a good chance to study it at a short distance for a long time with a strong pair of Zeiss glasses after checking up with descriptions in the above works and with the plate of Solitary and Spotted Sandpipers in Eaton's book.

My reasons for identification are as follows: its habitat was typical, and it was the right size. Its flight was quite different from that of the Spotted Sandpiper (with which I am familiar and with which it might possibly be confused) and it has a trick of holding its wings aloft when alighting, and then slowly closing them. It was pure white underneath and the edge of the wing was brown without spots, forming a strong contrast. The wing

coverts and back were brownish with small white spots. Outer tail feathers were white with brown bars while the middle feathers were quite dark brown. There was a small white eye ring but no distinct white line over the eye. The head, neck, and upper breast were streaked and spotted with brown and gray and the markings seemed to form a rather indistinct collar. The bill was black, lighter near the base and the legs distinctly greenish. I made these notes on the spot.—R. Clifford Black, *New York, N. Y.*

Wilson's Phalarope and Black-necked Stilt in South Carolina.—On May 10, 1929, I found a Wilson's Phalarope and a Black-necked Stilt in a small tidal pool on the broad sand flats of James Island near Charleston, S. C.; a most unusual experience, since both these species are exceedingly rare in this State.

There are two other South Carolina records for the Stilt (*Himantopus mexicanus*); May, 1881, Arthur T. Wayne, and August 16, 1928, E. von S. Dingle. At the time I knew of only one other South Carolina record for Wilson's Phalarope (*Steganopus tricolor*), a specimen taken by E. B. Chamberlain on Sullivan's Island and now in The Charleston Museum. I learn, however, that on May 5, five days before I saw my bird, Mr. P. A. Dumont of the American Museum of Natural History in New York, saw a Wilson's Phalarope on Morris Island at the entrance of Charleston harbor. I understand that Mr. Dumont's Morris Island Phalarope was a male; my James Island bird was a female in high plumage. These, therefore, are two distinct records.

It was late in the afternoon of May 10 when I saw the Phalarope and the Stilt in the James Island pool, where Lesser Yellowlegs, Semipalmated Plovers and Wilson's Plovers were also feeding, while many other shore and marsh birds moved about over the surrounding sands or passed overhead. Early the next day I returned to the pool with Mr. Alexander Sprunt Jr., and Mr. Ellison Williams. Both Stilt and Phalarope were still present and we studied them carefully at close range. I saw them both again in the same place on May 13, but when I revisited the pool on May 17 it was deserted.—Herbert Ravenel Sass, *Charleston, S. C.*

The Avocet in Georgia.—Bent in his 'Life Histories' (Bulletin 142, National Museum) gives one casual record of the occurrence of the Avocet (*Recurvirostra americana*) in this state, a specimen taken at St. Marys, October 8, 1903.

On October 14, 1928, Mr. Frank Martin and I observed an Avocet on the salt mud flats known as Horseshoe Shoals, near the Savannah River entrance. No other was seen from that date until February 23, 1929, when I saw one flying by near the same locality. March 4 Mr. Martin and I saw one on a sand beach in company first with a flock of Gulls and Terns, later in the day with Black-bellied Plover and other shore birds. This bird was seen several times until March 7, when I succeeded in

getting close enough to shoot it. It was a female, fat and in good plumage. —IVAN R. TOMKINS, *U. S. Dredge "Morgan," Savanna, Ga.*

Black Vulture Nesting in Northern Virginia.—On May 11, 1929, Mr. Herbert S. Barber, of the United States National Museum, and my uncle, Mr. Harold B. Stabler, took me up the Potomac River from Washington, D. C., about half way to Great Falls. One of the purposes of the trip was to show me the nests of some Turkey Vultures of which Mr. Barber had known for years. They were situated on the south, or Virginia, side of the river, for here the banks are steep and rocky, and scattered broken boulders form many crevices and caves which are enticing nesting sites for the birds.

After climbing up a small cliff within which the first of these ancient aeries was located, we peered cautiously into the miniature cavern, and there, standing vigilantly over two tiny newly-hatched young, was the mother Vulture. On seeing us, she lowered her head and hissed softly, but gave no sign of trying to escape. Since I had fortunately brought my bird bands with me, we decided that it would be feasible to try to catch her; accordingly Mr. Barber and Mr. Stabler stationed themselves at two of the entrances to the cave, and by poking sticks at her, drove her over to the third, where I was waiting in readiness. At first she could not bring herself to risk a dash past me; in desperation she emptied the contents of her stomach, but even the unpleasantness of this did not drive us away; finally she made a break for liberty, only to be seized just as she was about free. Resignedly she waited for whatever fate might be in store for her, quiet but watchful.

Mr. Barber now brought out the two young, which hissed in a manner very similar to that of their mother as soon as they were disturbed, but he remarked at once that they were not white, like all the other downy young Turkey Vultures he had ever seen, but a light buffy brown color. No sooner had he announced this discovery, when I noticed to my amazement that the mother did not have a red head, but a pure black one! With a thrill we all suddenly realized that this was no longer a Turkey Vulture's nest, but had been adopted by the other species, the Black Vulture. Further observation brought to light the facts that the adult had a square, short tail, white veins to the primary wing feathers, and a less stocky and blunt head than a Turkey Vulture. The bill was decidedly weaker-looking, but in spite of this fact, the old bird managed to take quite a chunk out of one of Mr. Stabler's fingers, as he was holding her to be photographed and banded. After replacing the little ones in the nest, we quietly pushed her back into one of the entrances, and she promptly settled down upon her babies, apparently ignoring our presence and unperturbed by her recent experience. Thus we left her.

So far as I can ascertain the Black Vulture has never been found breeding so far north but recent records of its occurrence about Washington and elsewhere would seem to indicate that it was extending its range and the finding of this nest is additional evidence.

It is amusing to note that the Virginia-Maryland boundary line is high water mark on the south bank of the Potomac so that the nest missed being in Maryland by only about twenty-five feet. Mr. E. J. Court it is true, has recorded the breeding of this Vulture in Maryland (Auk, 1924, p. 275) but this was in St. Mary County in the extreme southern point of the state and far south of Washington.—C. Brooke Worth, *St. Davids, Pa.*

The Black Vulture Breeding in the Mountains of Virginia.—The Black Vulture (*Coragyps urubu*) is now a common permanent resident in Rockbridge County in the central part of the Valley of Virginia, and breeds here. On May 23, 1929, I had the opportunity of seeing a nest with young on the top of House Mountain, at an altitude of about 3000 feet. House Mountain is an isolated off-shoot of the Alleghany range. Mr. Chas. O. Handley, who has recently been with the Georgia Quail Investigation, tells me of finding nests on this same mountain as early as 1919, but I know of no published breeding record for such an altitude.

This nest was discovered by Dr. W. D. Hoyt and Mr. Hill of Washington and Lee University after I had searched for it unsuccessfully. Dr. Hoyt's son, Southgate Hoyt, accompanied me on the trip on May 23d. The nest cavity was under a pile of huge boulders. The cave had an opening above large enough for a man to crawl into, and tunnels from two sides at the ground level. There was no nest, unless the few sticks in a loose pile had been scratched together for that purpose. One of the parent birds flew out of the upper opening as we approached. There were two young birds, one somewhat larger than the other. They appeared to be three or four weeks old and to weigh about three pounds. They had no feathers, and were covered with a thick down of cream buff color, almost reddish above. As we went into the hole they began to vomit large pieces of meat, almost choking in the effort, and continued to do so at intervals as long as we were there. They constantly made a loud blowing noise through slightly opened mouths. It was not a hiss but more like the noise of a bellows. At every effort to get them out into the open they scrambled back into the darkness, jamming themselves under the overhanging rocks and burying their heads in the cracks. When we finally pulled them out to the end of the tunnel in a vain effort to get a good picture in the dim light, they fought each other fiercely and pecked at our hands. I feared that the larger one would peck out the eyes of the smaller. All this time the parent birds were flying about and alighting on the rocks near us at frequent intervals, showing little fear but careful not to get within reach. They made the same blowing noise when on the rocks. Another pair of Black Vultures and a pair of Turkey Vultures were in sight most of the time, and once three Ravens appeared.—James J. Murray, *Lexington, Virginia.*

The Turkey Vulture in Westchester County, N. Y.—On June 1, 1929, I saw a Turkey Vulture (*Cathartes aura septentrionalis*) at Chappaqua, in Westchester County, N. Y. The occurrence of the Turkey

Vulture in Westchester is, of course, exceedingly unusual. There have, however, been several of these birds reported in the county at various times during the past two or three years, and it may be that the species is extending its range east of the Hudson as, of course, it is a common bird on the west side of the Hudson much farther north than Westchester.—C. H. PANGBURN, *Chappaqua, N. Y.*

Field Identification of Vultures.—Perhaps a few additional remarks might be made on the subject discussed by Mr. William Howard Ball in the issue of April, 1929, namely, 'The Field Marks of the Black Vulture (*Coragyps urubu*).' My acquaintance with the Black Vulture was formed in the vicinity of Panama City, where this species, together with the Turkey Vulture (*Cathartes aura*), is almost constantly overhead. As Mr. Ball states, the Black Vulture soars just as does the Turkey Vulture, and their actions are very similar, but one soon learns to recognize the former species at a glance by its different shape, as well as by the quicker beats of its much shorter but very broad wings. In fact, to one accustomed to the supremely graceful flight of the Turkey Vulture, the Black Vulture's rapid flapping and bobtailed form appear almost ludicrous. The longer or more fully extended neck of the Black Vulture is also noticeable, whether in flight or at rest.

The light areas on the under surface of the Turkey Vulture's wings should no doubt have been referred to as gray rather than white. The pure white under wing coverts of the California Condor (*Gymnogyps californianus*) furnish the readiest means of distinguishing it from the Turkey Vulture, when seen from below. Some years ago, however, while observing three Condors in company with Turkey Vultures, I noticed a difference in the form of the wing which served to set apart the two species nearly as far away as they could be seen. The Turkey Vulture's wing curves smoothly upward toward the tip, the inner half being quite straight when looked at edgewise, or possibly slightly concave on the top. The Condor's wing also curves upward at the tip, but the inner half is decidedly arched, so that the wing, when viewed from front or rear, forms a very symmetrical sigmoid curve. The difference in the size of these two Vultures should ordinarily be apparent, but distances are often hard to estimate in the case of a soaring bird.—ROBERT S. WOODS, *Azusa, California.*

The Barn Owl (Tyto alba pratincola) Breeding in Colorado.—In the month of June of the years 1922 and 1923 the Barn Owl was found nesting in the attic of an old house a few miles east of Granada, Prowers County, Colorado, by Mr. Leonard White of that city. In each instance, the young taken were nearly full grown. One of these, which I saw and positively identified, was unusually dark, having much dusky and grayish in the upper parts and the underparts entirely buff. In so far as I can learn there are no previous records of the Barn Owl breeding in Colorado.—LEON KELSO, *Aurora, Colorado.*

The Barn Owl nesting on the Lower Savannah River.—Word was received that Mr. Fahey of the Lighthouse Service had found an Owl's nest in one of the range lights in the river. March 30, Mr. W. J. Erichson and I visited the beacon, climbing about forty-five feet above the water, where we found five eggs of the Barn Owl (*Tyto alba pratincola*). One egg was about to hatch, and the young bird could be heard in the egg at a distance of several feet. The nest was in a steel box under the light, open to the sunlight on one side, and was liberally carpeted with the remains of marsh rabbits (*Sylvilagus palustris palustris*) with a few Barn Owl feathers. Mr. Fahey says he has found eggs and young Owls there other years, but that they sometimes disappear between his visits to the light. Perhaps the flocks of Fish Crows (*Corvus ossifragus*) frequenting this section are responsible. The bird was not seen by us, but Mr. Fahey describes it as a "speckled bird with a white ring around its head." The nesting record is sufficiently unusual to be worth recording, it is believed.—Ivan R. Tomkins, *U. S. Dredge "Morgan," Savannah, Ga.*

A Further Note on the Horned Owl and Goshawk Migration in British Columbia.—During the period October 1 to December 31, 1927, a sporting goods store in Victoria, British Columbia, paid bounty on 271 Horned Owls all of which had been killed locally. At the Provincial Government Pheasant Farm 28 others were shot during this time. For the same period during 1928 bounty was paid on five birds only. As was the case ten years earlier the Horned Owl invasion of southern Vancouver Island took place during two successive winters and then, quite definitely, ceased.

As recorded in a previous note (Auk, Vol. XLV, p. 99) the Chinese residents of Victoria purchase Horned Owls for use as food. Further inquiries have elicited the information that sometimes the carcasses are dried for future use. In this condition the flesh is reputed to possess both therapeutic and aphrodisiac properties.

Commencing with January 1, 1928, the Provincial Government entered the field and during the calendar year (1928) paid bounty on 1025 Horned Owls taken in various parts of the Province. No information is at hand regarding the dates of capture except a general statement that the majority were taken during the autumn and early winter. The localities and number of birds turned in at each place are as follows: Ashcroft 20, Clinton 414, Cranbrook 1, Fort Fraser 1, Golden 13, Kamloops 100, Lillooet 2, Merritt 141, Nelson 17, Pouce Coupe 3, Penticton 63, Prince George 49, Quesnell 103, Revelstoke 6, Rossland 1, Smithers 6, Vernon 24, Williams Lake 33, New Westminster 18, Vancouver 8, Victoria 2. Reference to a map of British Columbia with these figures in mind suggests a probable invasion through the Cariboo, Nicola and Okanagan regions of the interior, an important migration highway, and a relative scarcity west of the Cascade mountains and in the eastern part of the Province.

In recent years, since the Ring-necked Pheasant and European Grey

Partridge have become established in the region surrounding Vernon, Okanagan Valley, the number of wintering Goshawks has increased perceptibly even when allowance is made for the periodic southern migration of the species following the "rabbit plague." Many local sportsmen make a practice of hunting Goshawks and to secure the bounty, which is paid by local subscription, the birds killed are brought to the City. Thus has occurred an opportunity of examining some 40 adult and 20 immature specimens during the past two winters. Some of the adults, irrespective of the apparently progressive lightening of striatulation on the ventral surface due to age, represent the dark-colored western race to which the name *striatulus* usually is applied; others are as pale as typical *atricapillus* from eastern Canada. To this latter race all immature birds examined have been referred.—J. A. Munro, *Okanagan Landing, B. C.*

An old Record of the Carolina Paroquet.—During the last days of the year 1838 and the first ones of 1839 four sailing vessels from Bremen, Germany, discharged their human cargo at New Orleans. The more than 700 immigrants were all members of one party of Lutherans from Saxony in Germany. They were not a needy, impoverished company, but consisted largely of professional people, well-to-do burghers, agriculturists, and merchants; also several lawyers, doctors, and apothecaries were among their number. They chartered a large Mississippi steamer, the Selma, to take them to St. Louis. The following quotation is from the diary kept on the trip by Dr. Vehse, a lawyer. "On Thursday we commenced the up-river trip. Nothing untoward occurred until we reached the bar at the mouth of the Ohio. Here the steamer was unable to make headway on account of the low stage of the river. The passengers went on shore and made small excursions into the forest close by. Near the shore was situated a large and beautiful farm. We made the acquaintance of the proprietor, who gave us one of his blacks as a guide. Some of us hunted a small species of Parrot, of which many were killed. They made a savory dish." (Quoted from Graebner, Lutheran Pioneers, page 14, Concordia Publishing House, St. Louis, Mo.) This may have been either on the Missouri side or in Kentucky, hardly in Illinois. The larger part of this company finally bought 4440 acres of land for themselves in Perry County, Missouri, not very far from the scene of their unexpected Parrot hunt.—G. Eifrig, *River Forest, Ill.*

Crotophaga ani in Pinellas County, Florida.—On February 24, 1929, at sunset, I discovered in a low growth of mangrove on the bay side of Long Key near the town of Pass-a-Grille, Florida, a single Ani which was collected the following morning not far from its roosting place. The bird proved to be an adult male in good flesh but rather worn plumage with nearly half the rectrices missing. Its stomach was empty save for one large grasshopper recently swallowed. It measured: length, 364 mm., wing, 154 mm., tail, 188 mm. The specimen is now in the Museum of Zoology of the University of Michigan at Ann Arbor.

There had been no southerly gales for many weeks at the time the Ani was found, but strong southerly winds are the rule in late winter and early spring in that vicinity. The bird appeared to be a lone straggler, no others of this species having been seen by me either before or since. This is believed to be the first published record of *Crotophaga ani* for the central west coast of Florida. There are five or more records of this species on the east coast of the state.—WILLIAM G. FARGO, *Jackson, Michigan.*

Proper Name of the "Parauque."—In a letter written from Brownsville, Texas, February 21, 1928, my friend Major Allan Brooks, asks how the letter "u" became misplaced in the name "Parauque" (*Nyctidromus albicollis sennetti*) of the A. O. U. Check-List, stating further that the Mexicans call the bird "Pow-rack-ee" and that Sennett (1879) wrote it "Pauraque." I have looked the matter up and find that Coues in his Check-List of 1882 follows Sennett and uses the same spelling in his 'Key to North American Birds' third edition (1887).

The changed spelling apparently first occurs in Ridgway's List of 1881 and is used in his 'Manual of N. A. Birds' and in the A. O. U. Check-List (1886). Ridgway gives no explanation so that it would appear to have been a typographical error which has been perpetuated ever since, except by Coues who naturally followed his own Check-List, and probably did not notice the spelling in the A. O. U. Check-List as he makes no comment when he compares his nomenclature with that of the latter work.

There seems no question but that as stated by Major Brooks the name is based on the Mexican imitation of the call of the bird and unless additional information is forthcoming it will appear as "Pauraque" in the new edition of the Check-List.—WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

Blue Jay in Denver, Colorado.—The first Northern Blue Jay (*Cyanocitta cristata cristata*) to be recorded from the City of Denver was seen by me on September 26, 1928. Almost twenty-five years ago the Blue Jay was found in the extreme northeastern part of the state, and the slowness of its movement up the valley to this point is rather remarkable. Attention to the bird seen in Denver, was attracted by the characteristic squawk with which I had become familiar in Illinois and which is easily distinguished from that of any of our native Jays. For several minutes the Blue Jay was in elm trees near our yard, and as it flew from one to another was identified by the white marks on wings and tail and the drooping crest.—THOMPSON G. MARSH, *4705 E. 35th Ave., Denver, Colo.*

Feeding Habits of the Florida Grackle.—Early in October of 1927, a flock of about twenty-five of these Grackles began to congregate in an oak tree just outside my window. They would arrive early in the morning and remain until about sunset.

At first I thought they swallowed the acorns whole as I watched them pick them up and hold them lengthwise in their bills, for minutes at a time,

but I never saw one swallowed. Watching more closely I found that they would roll the acorn around and bear down upon the shell until it was severed and then eat the meat. If the nut was too well matured it was dropped and a more tender one chosen. The birds were cautious and only one at a time would drop to the ground until nearly the entire flock alighted but several remained in the tree probably as outlooks. They would sever and eat the acorns on the ground or pick up one and fly to a limb, using the feet to hold it. Those feeding in the tree would go out to the end of a limb, pick off an acorn, and return to a substantial limb to break it open.—DONALD J. NICHOLSON, *Orlando, Florida.*

Yellow-headed Blackbird in Pennsylvania.—Mr. Sutton's note in the January 'Auk' (Vol. XLVI, p. 119) has no doubt aroused in an ornithologist now in Africa the same memory, of a rainy Pittsburgh morning that comes to me in South America. When the Yellow-headed Blackbird of Turtle Creek was reported to the Carnegie Museum, Mr. Rudyerd Boulton and I went out to investigate, although we knew Turtle Creek to be one of the worst mill towns in the Pittsburgh district, with all that this connotes of smoke, grime, and vile chemical fumes. A less likely place to find a wandering Yellow-head could hardly be imagined. Nevertheless we searched the region diligently—without finding the bird.

It may be added that at this time the days were very dark with heavy, low-lying clouds, mist, and with smoke held in by the clouds, so that errors in distinguishing color and even size and form could easily have been made by the gentleman reporting the unusual bird.

Of course there is nothing inherently impossible about any record of occurrence of a bird possessed of full powers of flight, but it would seem the better part of wisdom to omit from our serious literature records that are at all open to question.—ERNEST G. HOLT, *Carnegie Museum, Pittsburgh, Pa.*[1]

Xanthocephalus xanthocephalus in Southern Mexico.—In the collection of the Field Museum of Natural History is a female Yellow-headed Blackbird (no. 12444) taken at Iguala, Guerrero, Mexico, February 27, 1902, by Geo. F. Breninger. It is apparently a bird of the previous summer.

Dr. Harry C. Oberholser writes me: "There are, so far as I am aware, no records for *Xanthocephalus xanthocephalus* from the State of Guerrero, Mexico. There are published reports from the States of Guanajuato, Puebla, and Tlaxcala, and there are specimens in the Biological Survey collection from Jalisco, Michoacan, and the State of Mexico."

[1] The Editor welcomes such additional information as the above. When records are submitted by reliable members of the Union, he naturally infers that everything affecting the observation has been considered and submitted. It is manifestly impossible in these days to disregard sight records but it should be the duty of everyone submitting them to exercise the greatest care in verifying them and in presenting all the facts in the case.—W. S.

This would therefore appear to be the southernmost point from which the species has as yet been recorded.—Pierce Brodkorb, *Evanston, Illinois.*

A New Bird for New Mexico.—In Florence Merriam Bailey's new book, 'Birds of New Mexico,' she states: "There is at present no specific record for the Bobolink in New Mexico."

On July 13, 1925, I took an adult female Bobolink (*Dolichonyx oryzivorus*) near the Big Chama river, about halfway between Park View and Chama, Rio Arriba county, New Mexico.

In May, 1925, Mr. C. D. Bunker and I took a number of specimens of Bobolinks on their breeding grounds in the sand hill region of Nebraska near Valentine and their peculiar metallic note was still fresh in my memory in July of that year.

I probably would have overlooked this species while trout fishing in New Mexico on July 13 had I not heard their peculiar metallic "chink" in an alfalfa field while I was collecting grasshoppers for bait. Out of a flock of six, which seemed to be confined to this one field, I could obtain only one on account of their wariness and their habit of keeping under cover.

The specimen is now in my collection and is in fine plumage except for slight abrasions on the wing and pointed tail feathers.

In July, 1928, I was collecting in the vicinity of Chama but no Bobolinks were seen.—Dix Teachenor, *Kansas City, Mo.*

Breeding of the Dusky Seaside Sparrow on the Mainland of Florida.—While Mr. C. J. Maynard has found the Dusky Seaside Sparrow at Salt Lake about six miles inland from Titusville, Brevard County, Florida, he did not find them nesting and it therefore seems desirable to place on record the discovery of a breeding colony about a mile and a half east of the St. Johns River directly west of Indian River City, in the same county.

The birds were first discovered by Joseph C. Howell and Wray H. Nicholson in June, 1928. On visiting the spot on April 21, 1929, we found about twenty pairs breeding, making nests in the short wire grass among switch-grass and rushes on low moist ground. Only one nest was found containing eggs, and it was evident that the birds had just begun to breed. This nest was made of fine short pieces of dry grass built in dome shape with an entrance on the side. It was placed about three inches from the ground, concealed by bent over grass from above. The three eggs were of white ground color thickly sprinkled with reddish brown and lilac spots over the entire surface.—Donald J. Nicholson, *Orlando, Florida.*

An Albino Savannah Sparrow.—While driving along a country road near Lexington, Virginia, on April 1, 1928, I saw a bird in a flock of Sparrows flying up from a hedge-row that showed a very large amount of white. I had an 8x glass with me and after studying it at close range

for some time realized that it was an albino Savannah Sparrow (*Passerculus sandwichensis savanna*), showing a very interesting type of albinism. It was in a small flock of normal Savannah and Vesper Sparrows. The head, wings and tail had the normal coloring, the yellow line over the eye showing distinctly and, with the other markings on these parts, making the identification certain. These parts of the bird had not a touch of albinism. The upper part of the breast in a very small region had a few fine black streaks. All the rest of the bird—lower breast, belly, back and rump—was pure snowy white, the dark wings standing out sharply against the rest of the body. The white parts, except for the lines on the upper breast, showed total albinism. I could not return to the place that day and when I came back with a gun the next day, hoping to be able to take the bird, I failed to find it.

Three days later, not far from the same place, I noted an albino English Sparrow of a very beautiful and, so far as I know, a very unusual shade. It was a rich cream color all over, no white anywhere and not a dark feather, the cream deepening to ochraceous buff on the head and rump. I judged it to be an English Sparrow, though my only reason for thinking it to be that Sparrow was that it was feeding with a flock of English Sparrows in a vegetable garden by a much travelled highway. I watched it for some time and, passing there later the same day with my wife, we saw it again.—J. J. Murray, *Lexington, Virginia.*

Harris's Sparrow in Massachusetts, a New Record.—On the evening of April 20, 1929, Mr. Fred G. Floyd of Hingham, Massachusetts, telephoned to me a description of a large Sparrow which had been visiting his feeding station daily since April 11. From his description I inferred a Harris's Sparrow, a new species for the avifauna of New England and the following day I spent two hours at Mr. Floyd's home before I was able to collect the specimen. It proved to be an unmistakable *Zonotrichia querula*, a young female in molting plumage, the molt involving the body feather tracts to some extent, the secondaries and tail feathers.

Mr. and Mrs. Floyd first noticed the bird April 11, at which time its breast was much whiter than when collected. It came to their window shelf with Song Sparrows, Juncos and other ordinary winter visitors.

The bird was examined in the flesh by Messrs. Outram Bangs, James L. Peters and Ludlow Griscom, of the Museum of Comparative Zoology, and by Mr. Francis H. Allen, and then presented to the Boston Society of Natural History for its collection of New England birds, where it will rest beside the specimen of Golden-crowned Sparrow which I obtained in January, 1928, under very similar circumstances.—John B. May, *Director Division of Ornithology, State House, Boston.*

Lincoln's Sparrow Wintering at Jeffersonville, Montgomery County, Pa.—On November 24, 1928 an adult Lincoln's Sparrow (*Melospiza lincolnii*) was taken in one of my Sparrow traps and band No. A115294 was placed upon it.

It was taken again on December 9, 10, 13, and 21; January 2 and 27; February, 2, 4, 11, 16, 21, 23 (4 times), 24 (twice) and on the 25th.

On February 23, and 24 the ground was covered with snow, which accounts for the number of repeats on these days. At this time it was very noticeable that the bird was becoming rather tame, it would stand still in the trap or gathering cage and allow one to inspect it closely, previous to this it would not stand still for a fraction of a second.

On February 28 and March 2 it was seen on our lawn within thirty feet of the kitchen window.

The trap in which this bird was taken is situated on a southern slope among a group of wild cherry and elm trees about ten feet tall, and is about twenty feet from a state road where there is travel all the time. On the lower edge of the group of trees is a low marshy spot where water lays all winter and along this marsh are some thick clumps of grass and on one side is a dense blackberry thicket. Every time the bird was released it flew either to this blackberry thicket or one of the clumps of grass, apparently the noise of cars passing along the road did not disturb it in the least.

On February 24, Mr. W. Howard Ball of Washington, D. C., Mr. Henry Underdown and Mr. C. E. Underdown of the Delaware Valley Ornithological Club visited me and while here this bird came into the trap and my identification was corroborated by them.—Raymond J. Middleton, *Jeffersonville, Pa.*

Summer Tanagers and other Southern Visitors in Massachusetts.—On April 13, according to our weather reports, a severe storm passed over Texas, travelling east and reaching South Carolina late on April 14. Then it changed its course, following the coast and increasing in intensity, reaching a maximum on April 16 between the Delaware Capes and Massachusetts. Near my home in the latter state much property damage was caused by the extremely high tide which accompanied a wind of about seventy miles velocity.

On the morning of April 17, following the storm, Mr. Francis A. Foster telephoned me from Marthas Vineyard that a male Summer Tanager and an Indigo Bunting were at his feeding station. On April 18, Mr. Everett R. Eldredge, Jr., of Chatham, reported a male Summer Tanager picked up dead in that town. On the same date Mr. Allan Keniston of Marthas Vineyard reported two Summer Tanagers, one male Scarlet Tanager and an Indigo Bunting on the Island, and sent a female Summer Tanager to the Boston Society of Natural History. On April 20 my youngest son, Dick, aged thirteen, brought me a male of this species which he picked up dead near my home at Cohasset, and on April 22, Mr. Keniston sent a male in changing plumage to the Boston Society, and reported that a bird had been seen on Nantucket Island. He also sent a male Hooded Warbler from the island of Marthas Vineyard.

At Ipswich on April 19, there were three Indigo Buntings (their usual

migration date being about May 15–20) and a Wood Thrush. A Yellow-breasted Chat was reported at Amherst April 22 by Miss E. M. Smith.

I see no reason to doubt any of these sight records and these birds were undoubtedly all brought north by the storm described above.—JOHN B. MAY, *Director Div. of Ornithology, State House, Boston.*

Black-whiskered Vireo on Florida Keys.—The following notes on the Black-whiskered Vireo may be of interest to the readers of 'The Auk.'

On June 10, 1927, I was on Plantation Key Florida. This is one of the string of keys over which the F. E. C. R. R. passes on the way to Key West and is about seventy-five to eighty miles south of Miami. I had left the highway and gone up a line through the forest which had been cut by a surveying party. Not far from the road I flushed a Vireo.

The bird was easy to approach and as I had a pair of good Field Glasses I was easily able to identify it as a Black-whiskered Vireo. I looked around for a nest and soon located it when the other bird flew off. It was about fifteen feet up over the path and the four eggs were fresh.

I had no gun with me as I was not out for birds but I have the eggs and nest.

I believe the nesting of *Vireo calidris barbatulus* is very casual in southern Florida. This is the only set which I have personally taken in the state.—CAPTAIN KARL SQUIRES, *Ft. Humphreys, Va.*

Prothonotary Warbler (Protonotaria citrea) in New Hampshire.—On May 22, 1929, a Prothonotary Warbler was discovered at "Sanborn's Pond" in Concord, N. H., by J. J. Welsh and was under observation the two days following by the undersigned, and several other interested persons. This pond is a very small body of water between hill-slopes wooded with deciduous growth; it drains over a dike in a little brook that works its way through a swampy spot overgrown with alders and with larger second-growth trees. The Warbler was found at the lower end of the pond, at the little waterfall each time, and frequently sang its strong monotonous song, from four to six syllables in the series. It was accustomed to perch quietly at intervals, near the same spot, with or without delivering the song; then it would drop down and swing off to right or left some fifty yards or less. It fed on the wet ground of the swamp and on the edge of the pond and searched over decaying stumps. It was to all appearances a male.

It is believed this is the first time the species has been observed in New Hampshire.—JOHN J. WELSH, G. P. MILNE, F. B. WHITE, *Concord, N. H.*

Worm-eating Warbler at Ipswich, Mass.—On April 19, 1929, while driving along the road from Ipswich toward Little Neck with Messrs. Charles E. Clarke, of Medford and John H. Conkey, of Boston, we stopped to look over some birds in an adjoining field and discovered a Worm-eating Warbler in a low bush beside the road. We had it under observation through our binoculars for about ten minutes, and carefully noted the

olive-green back, wings and tail without white markings, the yellowish underparts and the four black lines on the head, with intermediate creamy-buff areas. It kept near the ground much of the time, but once when disturbed by a passing car it flew some distance away to a tree, but soon returned and later crossed the road, making short flights from one bush or tree to another, and finally flew up the hill and disappeared. The preceding three days had been very stormy, with winds of gale force, and doubtless this bird had been blown far out of its course. Following our description of the place where it was found, it was seen the next day, April 20, by Mr. S. Gilbert Emilio, of Salem. All of the observers mentioned, with the exception of Mr. Conkey, had previously seen this species in life in southern Connecticut. Dr. Charles W. Townsend in the 'Birds of Essex County' (Memoirs Nuttall Ornithological Club, vols. III and V) mentions but one record for the county, a bird first seen on April 14, 1902, at Salem, and collected two days later, the specimen being in the Peabody Museum at Salem. Through the courtesy of the office of the State Ornithologist, Dr. John B. May, I have been permitted to examine the manuscript relating to the Worm-eating Warbler for the third volume of 'Birds of Massachusetts and other New England States,' by the late Edward Howe Forbush, and find two additional sight records given for Essex County, one at Lynn, May 29, 1919, by Mary I. Tufts, and one at West Manchester, June 3, 1920, by Miss E. D. Boardman.—George L. Perry, *68 Thurston Street, Winter Hill, Somerville, Mass.*

The Connecticut Warbler in New Jersey in Spring.—On June the sixth of this year the writer had the good fortune to see the Connecticut Warbler (*Oporornis agilis*) under conditions unusually favorable for observation. The bird, a male, was first heard singing on the shore of Broad Street Pond, about one-and-a-half miles southeast from the city of Trenton, N. J., and about three-quarters of a mile north from Long Bar Island in the Delaware River. The shore of the pond at this point is clothed with bushes, vine tangles, and tall trees, and lies at the base of a sandy bluff about sixty feet high. The song, repeated a dozen or more times before the bird was located, was transcribed into a field note-book, and is, to the writer's ear, perfectly rendered by the syllables: Chu wheee you whiddle you CHIP! The accents fall strongly on the syllables *wheee*, *whid*, and *chip*. This corresponds somewhat, in accent and rhythm, to Ernest Seton-Thompson's rendering of, "Fru-chapple, fru-chapple, fru-chapple, whoit." The *chu* syllable was sharp, but not loud. The *wheee* syllable was delivered with force and clarity, and the final *chip* with an upward inflection, full of vigor and a final liquid snap as though one were cracking a whip. The whole song was loud, and arresting, and abrupt. After the bird was discovered it was watched through binoculars while it sang some four or five times more, and it was noted that while the head was elevated slightly, and nodded with the vigor of the utterance, the body, wings, and tail, were held quiet and did not vibrate. The song was given

once every fifteen or twenty seconds, the bird stopping its feeding while it sang.

The conditions under which the bird was seen were excellent for examination, and although the writer had never before seen the species in life, he was perfectly familiar with it from the study of skins and mounted specimens in his laboratory. The bird was watched for some ten minutes, through eight-power binoculars (30 mm. aperture—the "Deltrintem" glass of Zeiss), at a distance of about 25 feet, the light falling upon the bird from behind the observer's back. The whitish eye-ring was plainly to be seen, and was, in fact, a conspicuous color-feature of the side of the head; giving the bird, it seemed, a wild and "stary" appearance. Its leisurely, Vireo-like movements and feeding habits, made it an easy object to keep in the field of the binoculars. It kept among the shadows, however, and in this environment its hues of gray, olive, and yellow assimilated to the gray twigs and branches, and the greens and yellows of the leaves in a way very effective from the standpoint of obliterative coloration. So inconspicuous an object was it to the naked eye, that it is doubtful if it would have been seen, had it not been for its attention-arresting song.

This record is an interesting one to the writer, since the species is reported to travel, in its spring migration, up the Mississippi Valley.—Dr. Leon Augustus Hausman, *N. J. College for Women (Rutgers University), New Brunswick, N. J.*

Long-tailed Chickadee in Iowa.—A young man brought to us for banding a Chickadee whose tail was 2.88 inches long. We believe this to be the Long-tailed Chickadee (*Penthestes atricapillus septentrionalis*). He now wears band No. B58615. There are few if any authentic records of the Long-tailed Chickadee for Iowa. We have measured a good many Chickadees and this is the only one we have found that could be identified with certainty by measurements.—Dr. F. L. R. and Mary Price Roberts, *Spirit Lake, Iowa.*

Bird Notes from Piedmont Virginia.—For several years the writer has been contributing weekly articles, under the heading, 'The Rambler,' to the Lynchburg Sunday 'News.' Readers of this column frequently send in items of interest on Virginia birds. Recently Mr. J. O. McCutchen of Altavista, Virginia, reported finding an Old-squaw drake at Long Island, Va. He states that this is the first time he has found this bird so far inland. He also reports four or five Woodcock and a Wilson's Snipe being found during the past winter near Altavista. The Wilson's Snipe (*Gallinago delicata*) was observed on December 25, and the Woodcock (*Philohela minor*) during January.

Mr. McCutchen also reports that the Pileated Woodpeckers (*Phloeotomus pileatus pileatus*) are evidently increasing in his locality. They seem to be twice as numerous as during the preceding year.—Ruskin S. Freer, *Lynchburg College, Lynchburg, Va.*

Some Biloxi, Mississippi, Bird Notes.—In 'The Auk' for October, 1922, pages 530–556, Mr. Julian D. Corrington published a list of 'The Winter Birds of the Biloxi, Miss. Region' with an excellent detailed account of the varied characteristics of this locality. In 'The Auk' for January, 1923, page 146, the writer recorded several species not observed by Mr. Corrington but which were observed by himself at Biloxi during February, 1918. The writer spent the latter half of February, 1928, at Biloxi where the following observations were made from the sea wall along the Mississippi Sound. These records add several additional species to the Biloxi list of winter birds.

Larus atricilla. LAUGHING GULL.—This species was included in the Corrington list but was not observed by Mr. Corrington personally. During my 1918 visit I observed two Laughing Gulls and this species was observed on several occasions during my 1928 visit.

Ereunetes pusillus. SEMIPALMATED SANDPIPER.—Not included in the Corrington list. On February 19, 1928, fifteen of these lively little Sandpipers were observed running about the beach with the Sanderlings.

Crocethia alba. SANDERLING.—Not included in the Corrington list. A flock of forty observed on February 16, 1928, and ten were seen in the same locality on the 19th.

Catoptrophorus semipalmatus. (subsp.?). WILLET.—Not included in the Corrington list. Ten of these large Waders were observed on February 16, 1928. They were still in the same locality on the 19th.

Progne subis subis. PURPLE MARTIN.—Purple Martins were first noted on February 18, and a few were observed each day following. Mr. Corrington also reports the Purple Martin as arriving on February 18th.

Seiurus noveboracensis (subsp.?). WATER-THRUSH.—Not included in the Corrington list but seen by the writer during his 1918 visit. On February 19, 1928 I was surprised to find a Water-Thrush walking about on the sand at the foot of the sea wall. Less than a hundred feet away a flock of Sanderlings and Semipalmated Sandpipers were running about feeding. This Water-Thrush appeared to be in excellent condition and was observed again on the 20th and 21st at almost the identical spot. The bird seemed out of place on this salt water beach although it acted very much at home. When pressed too closely it would make a short flight along the base of the sea wall and again alight upon the sand uttering its single sharp note. I noted that at intervals along the base of the sea-wall were the openings from the city drains which were undoubtedly what attracted the Water-Thrush.—CHRESWELL J. HUNT, *810 South Eighteenth Ave., Maywood, Ill.*

Notes from Berrien County, Michigan.—The following observations made between August 26 and 28, 1928, in Berrien County, Michigan, seem worthy of record.

Lophodytes cucullatus. HOODED MERGANSER.—Two were flushed from the Galien River in Warren's Woods near Three Oaks on August 28. It is not included in Mr. Norman A. Wood's list of birds seen in the county (Univ. Mich., Occas. Papers Mus. Zool., no. 119).

Pisobia minutilla. LEAST SANDPIPER.—A single individual seen on the beach at Tower Hill, August 27. Not included in Mr. Wood's list.

Bartramia longicauda. UPLAND PLOVER.—Three were seen August 26 in a field northeast of Three Oaks, where they breed every year. They were exceedingly wary. Mr. Wood gives it as rare.

Cathartes aura septentrionalis. TURKEY VULTURE.—One seen August 26 near Three Oaks.

Empidonax virescens. GREEN-CRESTED FLYCATCHER.—A specimen secured on August 28 (Warren's Woods) was the only one seen.

Vireosylva olivacea. RED-EYED VIREO.—Omitted from Mr. Wood's list, probably through a printer's error. It is, of course, common.

Protonotaria citrea. PROTHONOTARY WARBLER.—A fine male was secured in Warren's Woods August 28. It was a bird of the year.

Dendroica caerulea. CERULEAN WARBLER.—About six singing males werefound in Warren's Woods on August 28. They were much too shy for me to get a shot.

Sitta c. carolinensis. WHITE-BREASTED NUTHATCH.—Common, and specimens were taken. Apparently its status has changed since Mr. Wood worked this region, as he gives it as very rare.

Baeolophus bicolor. TUFTED TITMOUSE.—Very common in Warren's Woods August 28, when several were taken.—PIERCE BRODKORB, *Evanston, Illinois.*

Summer Notes from Southern Illinois.—Messrs. James Stevenson, Leland Quindry, and I spent June 15 to 24, 1928, in southern Illinois, and some of the more interesting records follow.

Nyroca collaris. RING-NECKED DUCK.—A full-plumaged male was seen on June 22 near Marion, Williamson Co., where it remained for about a week.

Nyctanassa violacea. YELLOW-CROWNED NIGHT HERON.—One seen on June 18 near Shawneetown, Gallatin Co., was too wary to permit a shot.

Catharista urubu urubu. BLACK VULTURE.—Seen June 19 at Alto Pass, and June 22 near Marion.

Falco peregrinus anatum. DUCK HAWK.—One was seen at Marion on June 16.

Antrostomus carolinensis. CHUCK-WILL'S-WIDOW.—Several were seen and heard June 22 near Marion.

Sturnus vulgaris vulgaris. STARLING.—Five were seen within the city limits of Olney on June 16, and Mr. Ridgway informed us that he shot several there in January, 1928.

Peucaea aestivalis bachmani. BACHMAN'S SPARROW.—We found this bird breeding quite commonly at several points near Marion, where a male was taken on June 17.

Compsothlypis americana ramalinæ. WESTERN PARULA WARBLER.—A male was secured June 19 at Alto Pass. The spot where it was collected has about the highest elevation in the state and was some distance from water.—PIERCE BRODKORB, *Evanston, Illinois.*

Order of Awakening of some Arizona Birds.—The following observations were made in course of night observation of the porcupine in the yellow pine forest near the Southwestern Forest Experiment Station, Flagstaff, Arizona, on July 6, 1925.

The first bird to awaken and become active was the Violet-green Swallow, which began flying about, twittering at 3:37 A.M. Two or more individuals were noted. At first the twittering was subdued, but it became stronger and stronger as the Swallows seemed to get in the spirit of the thing. Their activity continued right on through until daylight.

The Robin began singing at 4:04. Other species were first noted as follows: Chestnut-backed Bluebird, 4:30 A.M.; Mourning Dove, 4:30 A.M.; Arizona Chipping Sparrow, 4:56 A.M.; Rocky Mountain Jay, 5:03 A.M.; Junco, 5:09 A.M.; Broad-tailed Hummingbird, 5:11 A.M.; Pigmy Nuthatch, 5:16 A.M.; Cabanis' Woodpecker, 5:20 A.M.; Slender-billed Nuthatch, 5:23 A.M. Nighthawks (*Chordeiles*) were heard booming at intervals from 1:00 A.M. on to daylight.—WALTER P. TAYLOR, *Tucson, Arizona.*

Birds and Motor Cars.—In April, 1927 ('Auk', XLIV, 265–6) was published a note by me about birds killed on New England roads, and about rate of flight indicated by speedometer. To continue that note, I will now add as to birds killed that from the spring of 1927 to the spring of 1929, driving twenty-two thousand miles or so in New England, most of which driving was done from the middle of June to the middle of September, I have seen only nine dead birds in the road: one Oven-bird, one Goldfinch, and the others unidentified.

As to speed of flight, the following figures were determined by entirely satisfactory observations: many observations less satisfactory bore out the general rates: Ruffed Grouse at 22 miles per hour; Northern Flicker, 20; Kingbird, 15; Bluejay, 20; Starling, 18; Bronzed Grackle, 30; Vesper Sparrow, 17; Indigo Bunting, 20; Catbird, 16; Robins, 20, 23, 30, 32; Bluebirds, 17 (carrying food), 17 (not carrying food).—F. B. WHITE, *Concord, N. H.*

Plates of 'Birds of Patagonia.'—When I undertook the completion of the report on birds obtained by the Princeton Patagonian Expedition, which had been begun by the late W. E. D. Scott, I found a number of colored plates reproduced from paintings, made under his supervision at the British Museum. Some of the titles on the plates, which had been printed in Germany, were obviously wrong but as I could find no record of what specimens had formed the basis of the figures I was compelled to identify them solely from the printed plates—no easy matter in the case of the Dendrocolaptidae.

Dr. C. E. Hellmayr on a recent visit to the British Museum made an effort, with the aid of Mr. C. B. Kinnear, to identify the specimens from which the paintings were made and found that some of them were marked "figured in P. P. R." Thanks to his courtesy I am thus able to state definitely that:

Pl. 3, lower figure, is *Upucerthia validorostris*.

Pl. 4, both figures, *U. saturatior*.

Pl. 5, upper figure, *U. fitzgeraldi*.

Pl. 5, lower figure, *U. dumetaria darwini*.

Pl. 6, both figures, *Cinclodes taczanowskii*.

Pl. 3, upper figure is apparently from a specimen in the Princeton collection.—WITMER STONE, *Academy of Natural Sciences, Philadelphia.*

RECENT LITERATURE.

Friedmann's 'The Cowbirds.'—As many of our readers are aware Dr. Herbert Friedmann has been, for some years, investigating the subject of parasitism in birds, a topic which has brought into print more nonsense and pure theory and fiction than perhaps any other phase of bird life, and which was in need of much scientific investigation.

The work now before us[1] comprises the results of his field work on the Cowbirds—three years intensive study of the Eastern Cowbird at Ithaca, N. Y., one breeding season spent in Argentina and one on the Texas-Mexican border, investigating the Cowbirds found there; also the results of an exhaustive study of the literature of the subject.

Dr. Friedmann has first considered all of the species of Cowbirds which he arranges in three genera, *Agelaioides*, *Molothrus* and *Tangavius*. He discusses under each, its range, migration, courtship and mating, song and call notes, sexual relations, territorial relations, nests and nest building (if any), eggs and egg laying, young, food, plumage and molts, enemies, and common names; with full synonymy and keys for determination. Besides his personal observations extracts from pertinent literature are included, in their proper place, thus putting at the disposal of the reader practically all the information now available. Under the purely parasitic species, cases of parasitism in connection with various hosts are considered in detail—involving no less than 114 species and subspecies parasitized by the Eastern Cowbird, which require 54 pages for their discussion. There is also, under this species, a detailed analysis of its food.

At the close of the systematic treatment, which occupies the bulk of the text, Dr. Friedmann presents two chapters in which the results of his work are summarized; one on the evolution of the present Cowbirds and the other on the origin and evolution of the parasitic habit. The appendix contains a discussion of the habits etc. of the Rice Grackle (*Cassidix oryzivora*), which is in many ways an enlarged Bronzed Cowbird; and a bibliography of some 650 titles.

We must leave to the reader the study of the details of this important and interesting monograph—the reasons for considering some of the Cowbirds as developing evidence of host specificity (parasitism on a single species only); the habit of associating with cattle, originally developed on the western prairies with the wild buffalos; the actions of the young fledgling in demanding food from passing birds which are not even its foster parents, etc., etc. We may here, however, briefly summarize Dr. Friedmann's last chapter. He considers that his evidence shows that Cowbirds were originally normal nest building birds. He finds that the

[1] The Cowbirds, A Study in the Biology of Social Parasitism. By Herbert Friedmann, Amherst College. Charles C. Thomas, Publisher. Springfield, Illinois, Baltimore, Maryland. 1929 pp. i–xvii + 1–421. Price $6.00.

Bay-winged Cowbird (*Molothrus badius*) of South America, while usually appropriating the nest of other species, sometimes builds one of its own, and always incubates its eggs and rears its own young. The Shiny Cowbird (*Molothrus bonariensis*) is parasitic but has the habit poorly developed, while the Eastern Cowbird of the United States has the parasitic habit fully developed. Thus we have a gradual evolution of the habit in the various species.

He finds moreover that while, like other birds, the male of some Cowbirds establishes a territory which he protects from intruders, this is only perfectly developed in the mongamous Bay-winged species and becomes less apparent in the parasitic species, while the protective instinct of the male in defending the nest decreases correspondingly. With the lessening of interest in the nest and the lack of protection on the part of the male, the normal life is distorted and the way laid open to parasitism. It is the use of a nest already built, and the consequent placing of nest ahead of territory that, in his estimation, tends to break down the female's interest in the nest and the male's habit of territory defense.

Dr. Friedmann concludes by stating that his explanation is by no means the last word on the subject, and is offered more as a suggestion than anything else. We must know more about the physiology of reproduction in birds, especially the physiological basis of instinct, before we can hope to progress much further, and much more careful and accurate field observation is needed.

Dr. Friedmann has brought together a most valuable mass of information and has placed his subject on a basis where definite advance in our knowledge should be more easily possible. The book is well printed and the numerous photographs of nests and young add to its interest. We are sorry to find that apparently the quotations have not all been checked with the originals as for example, in a paragraph from Wilson on p. 159, the use of "not" for "now" and "affection" for "affectation" materially alters the sense.

We also notice, as is frequently the case in linotype printing, that the wrong line is sometimes removed or a rejected line inserted where it does not belong.

Dr. Friedmann is to be congratulated upon his painstaking study of the complicated problem of parasitism and we shall look forward with interest to his further publications on the subject, wherein he promises to discuss it more widely with reference to all of the parasitic species.—W. S.

Saunders on Bird Song.—It is by no means the largest and most conspicuous works that contain the most important matter, and a little brochure on 'Bird Song'[1] by Aretas A. Saunders seems to us to rank as one of the most important contributions to ornithological literature of the last few months.

[1] Bird Song. By Aretas A. Saunders, New York State Museum, Albany. 1929. New York State Museum Handbook 7, pp. 1–202.

Mr. Saunders, as readers of 'The Auk' well know, has been devoting his attention to bird song for many years past and most of his publications on the subject have appeared in these columns. He has devised what is apparently the most practical method of recording songs that has yet been suggested and the number of songs that he has "collected" in this manner may be realized when we learn that he has upwards of 600 Song Sparrow songs alone, in his collection.

While there have been a number of papers dealing with one phase or another of bird song, some of them serious efforts based upon wide experience, others largely speculative, there has been no recent summary of the whole subject, and this is what Mr. Saunders has attempted in the present little booklet. His success in getting so much information in such small compass, and in such readable form, is remarkable.

As he says, what we wish to know is, "how birds sing, why they sing and how the songs have originated and developed." Under the first head he differentiates between song and call, or alarm, notes, then he divides songs into four types, depending on length and complication; next variation is considered, between individuals and on the part of the individual; then the seasonal cycle of song (in connection with courtship, nesting, molt, and winter) and the daily cycle (morning awakening, mid-day cessation, evening and night singing); mimicry; acquirement of song by young; relation of bird song to human music; purpose of song; origin of song; and how to study song, all come in for discussion. There are a number of excellent outline drawings of various birds in song showing position etc., and some fifty charts of songs.

In discussing the purpose of song, Mr. Saunders states that, while there are cases of female song, singing in birds is almost entirely confined to the male, which seems to indicate that it has something to do with mating, while the fact that the song of each species is distinctive indicates that its purpose is recognition, though obviously of less importance in this connection than is plumage. Its variability too would indicate that it may have several purposes. Call and alarm notes are the bird's language but song has no such definite object.

Mr. Saunders selects the "territory" theory as the most satisfactory explanation of bird song—that the male upon arrival in the spring selects a territory with a singing tree in the center from which he sings and thereby warns other males away, and advertises the fact to females of his species that he is seeking a mate. The song is thus both a warning and an attraction, though several other minor purposes of song are explained. Under the head of evolution of song our author states that as birds are descended from a reptilian ancestor their song must have developed from some such sound as the hiss of a snake or tortoise, the alarm notes and call note coming first and song, later, by combinations and elaboration of the former, induced by excitement of courtship or conflict. Mr. Saunders considers that the evolution of song toward an ideal must involve an esthetic sense on the part of the bird, and as sexual selection has not proved

a satisfactory explanation for the production of such a sense he is at present unable to suggest what force may have produced it.

Mr. Saunders discusses mimicry as a possible method by which birds may have improved their songs and seems to give considerable credence to Scott's claim that young birds learn their songs by mimicry. Since, however, he shows that song usually ceases with the hatching of the young it seems hardly likely that the young birds can hear their own parents sing and if they learned song through mimicry it would most likely be the song of some other species, which sang later in the season. We are not at all inclined to give to Scott's experiments the support that some have given them, especially since others have had exactly opposite results in the same sort of experiments. Also, in discussing the esthetic sense and the "ideal" toward which bird song is supposed to be tending, should we not give more attention to the question whether our human ideal is the same as that of the bird or whether the bird songs that rank highest in our musical estimation have any such position in the bird world?

Mr. Saunders' methods of recording song are of the utmost importance and should be studied by all interested in the subject. Only lack of space prevents us from taking this matter up in the detail which it deserves.

We must congratulate Mr. Saunders upon a most important contribution to this branch of ornithological literature, especially valuable since there are but few who are equipped to discuss the subject with anything like authority.—W. S.

Mackay's Shooting Journal.—Mr. George H. Mackay, veteran sportsman and ornithologist of Nantucket and Boston, has done a very fine thing in keeping an accurate journal of his gunning trips with a list of birds shot during a period of nearly fifty years (1865–1922), and his friend, Dr. John C. Phillips, an equally fine thing in having it printed in a limited private edition[1] for the pleasure and profit of other sportsmen and naturalists.

Mr. Mackay, like Dr. Phillips, is not only a real sportsman but a conservationist, and his labors in behalf of better bird and game protection are well known, while his numerous contributions to ornithology have appeared in the pages of 'The Auk' for the past twenty-six years. His careful accounts of the game birds of the Massachusetts coast and a few other localities, as presented in his journal, furnish us with a most valuable record of what used to be, when Golden Plover and Eskimo Curlew were common species on these shores.

Would that those who have in their possession such journals, kept either by themselves or their parents, would follow Dr. Phillips' example

[1] **Shooting Journal of George Henry Mackay 1865–1922. Three hundred copies privately printed for John C. Phillips. By the Cosmos Press Inc., Cambridge, Mass. 1929. pp. 1–373, frontispiece portrait.**

and put them on permanent record before the fragile manuscripts are lost forever. And would that our present day sportsmen would take the time to keep such records for the benefit of posterity.—W. S.

Bent's Life Histories of North American Shore Birds.—We have before us Mr. Bent's eighth volume[1] of his "life histories," completing the Shore Birds, and would congratulate him upon the splendid progress that he is making with this great undertaking.

Many familiar species are treated in the present volume including the Willet, Upland Plover, Spotted Sandpiper, Hudsonian Curlew, Black-bellied and Semipalmated Plovers, Killdeer and Turnstone. As heretofore the author has had the hearty coöperation of a host of students of the breeding habits of birds, as well as of photographers, so that the high standard of both text and illustrations is amply maintained, while Mr. F. C. Lincoln has again, on behalf of the Biological Survey, compiled the distributions of the species from the Survey records. Several special life histories have been contributed by Dr. Charles W. Townsend, Rev. F. C. R. Jourdain and Dr. Winsor M. Tyler.

In turning the pages of Mr. Bent's work we must again expresss our amazement at the vast amount of information that he has been able to collect and the admirable manner in which it has been presented. All ornithologists are indeed deeply indebted to him for his devoted labors in their behalf.—W. S.

Audubon Bird Cards.—We are pleased to see another set of "bird cards" issued by the National Association of Audubon Societies, from paintings by Allan Brooks. This set[2] is entitled "50 Summer Birds of Eastern North America" and contains an excellent collection, without of course duplicating those in previous issues.

The artist, in the great majority of cases, has been most successful in his poses, and the color reproduction is excellent with the exception of the Least Flycatcher, Warbling Vireo and Catbird which are entirely too dark. The text is helpful and instructive.

The value of these bird cards cannot be overestimated; not only will they prove indispensable to schools and children but every lover of birds will wish to have a set for handy reference in his ornithological library.—W. S.

Hellmayr on the Ornithology of Northeastern Brazil.—When Dr. Hellmayr came to Chicago to assume the continuation of Cory's

[1] Life Histories of North American Shore Birds, Order Limicolae (Part 2). By Arthur Cleveland Bent of Taunton, Massachusetts. U. S. National Museum Bulletin 146. Washington, 1929. pp. i–ix + 1–412 (63 of the 66 plates are included in the pagination but plates 1 to 3 are not). Price $1.00; to be had from the Supt. of Documents, U. S. Govt. Printing Office, Washington, D. C.

[2] Audubon Bird Cards, Set No. 3. 50 Summer Birds of Eastern North America. From Color Drawings by Allan Brooks. Published by the National Association of Audubon Societies, 1974 Broadway, N. Y. City. Sold in Sets. Price $1.00.

'Birds of the Americas' there were Brazilian explorations either completed or planned which have resulted in the acquisition by the Field Museum of much valuable material from the states of Maranhao, Piauhy and Ceara, obtained mainly by R. H. Becker and H. E. Snethlage. These collections form the basis of an extended report by Dr. Hellmayr[1] which has recently appeared as Publication 255 of the Museum.

The author has greatly enhanced the value of his work by including all published records of the birds of the region under consideration and by the study of collections in European museums, notably that of O. Reiser in the Vienna Academy. No less than 524 species and subspecies are included with full references, lists of specimens examined and comments on distribution and relationship. A valuable introduction contains a discussion of the zoogeography and history of the region as well as the itineraries of the several expeditions.

Unfortunately there is no index nor list of new forms described, both of which would be of great assistance to those who use the report. We note however the following new forms *Empidonomus aurantioatrocristatus pallidiventris* (309) new name for *E. a. minor* Hellmayr; *Neorhopias serrana* (p. 377) Minas Geraes, Brazil; *Threnetes leucurus medianus* (p. 381) Tury-assu, Maranhao, Brazil; *Eupetomena macroura simoni* (p. 386) Rio do Peixe, Bahia; *Veniliornis passerinus transfluvialis* (p. 413) Macaco Secco, Bahia; *Picumnus exilis alegriae* (p. 419) Tury-assu, Maranhao; *Forpus passerinus flavissimus* (446) Tury-assu, Maranhao.

Dr. Hellmayr's report is one of the most important recent contributions to the ornithology of Brazil and will be of the greatest assistance to the student of the neotropical avifauna.—W. S.

Miss Cooke on the Birds of the Washington Region.—Since the classic list of Coues and Prentiss in 1862 there have been a number of lists of the birds of Washington, D. C. and now Miss Cooke has added another,[2] bringing the matter up to date and forming the most satisfactory and comprehensive compilation on the subject.

The number of species has increased from 224 (with 2 hypothetical) in 1862 to 301 (with 7 hypothetical and 3 hybrids) in 1929, though we note that the count in 1928 is given as 306 with 2 hybrids and 2 hypothetical, just which forms have been transferred and what additional species has been added is not clear.

There is a chronological bibliography which lists all of the important publications on the birds of the District, and tables of arrival and departure dates, while the main portion of the text consists of a well annotated

[1] A Contribution to the Ornithology of Northeastern Brazil. By Charles E. Hellmayr, Associate Curator of Birds. Wilfred H. Osgood, Curator, Department of Zoology, Editor. Publication 255 Field Museum of Natural History, Zoological Series, Vol. XII, No. 18. Chicago, March 4, 1929. pp. 235–501 with outline map.

[2] Birds of the Washington D. C. Region. By May Thacher Cooke. Proc. Biol. Soc. Washington, Vol. 42, pp. 1–80. March 25, 1929.

list. Probably no area in the United States has undergone intensive study by so many notable ornithologists as has the vicinity of Washington and yet we find that an additional species was added to the list in each of the years 1926, 1927 and 1928 so that it would appear that we can never exhaust the ornithology of any district, and that, as Dr. Grinnell has somewhere stated, the potential bird list of any state or district is that of North America!

Miss Cooke is to be congratulated upon a very careful piece of work which will be of the greatest value to the bird students of the District and its environs.—W. S.

Schantz's 'Birds of Illinois.'—Illinois is fortunate in the number of its state bird lists. It is not long since we had the pleasure of noticing the Audubon Society's 'Check-List' by B. T. Gault, and now we have a handy little booklet by O. M. Schantz,[1] published by the State Department of Conservation. It is a list of the birds of the state with technical and English names, the length of each species, mention of several prominent field marks, and an indication of the character of its occurrence. There are in addition numerous illustrations in the form of text cuts which have been borrowed from various sources, some of them, having done service for upwards of fifty years, are nevertheless better than certain of the more modern productions, notably a figure of the Greater Yellow-legs with legs not more than half their proper length.

Unfortunately the figures marked Nighthawk and Whip-poor-will seem both to represent the former species and are likely to still further confuse these birds in the popular mind.

These however are minor slips. There is an excellent introduction, descriptive paragraphs at the head of each family and a closing chapter on the economic value of birds which will do much good, while the attractive colored figure of the Cardinal on the cover will draw the attention of many persons to a perusal of the contents with profit both to the birds and to themselves.—W. S.

Lucanus' 'Rätsel des Vogelzuges.'—Dr. Lucanus has recently issued a third, revised, edition of his little volume on bird migration[2] reviewed in these columns in 1922. Evidently the work is attracting merited attention and while it still lacks consideration of recent American publications it presents an excellent review of the subject from a European viewpoint. Through such publications as this the ranks of bird banders

[1] Birds of Illinois. By Orpheus Moyer Schantz. Conservation Publication No. 6. State of Illinois Department of Conservation. Springfield. 1928. pp. 1–123 including title page and map but excluding 6 pages of index.

[2] Die Rätsel des Vogelzuges, Ihre Lösung auf experimentallem Wege durch Luftfahrt und Vogelberingung. Von Friedrich von Lucanus. Dritte, vermehrte und verbesserte Auflage. Mit 4 Textabbildungen und 1 Tafel. Langensalza, Hermann Beyer & Söhne (Beyer & Mann.) 1929. pp. i–x+1–266. Price 8. 40 RM, bound 10 RM.

and other students of migration should be greatly increased and perhaps some of the "mystery" of the subject eventually dispelled.—W. S.

Todd's 'Review of the Wood Warblers of the Genus Basileuterus and its Allies.'—This paper[1] is a careful detailed study of a rather difficult group and will prove of great help to the student of neotropical birds. Mr. Todd explains why he finds it necessary to recognize the genera *Myiothlypis* (for *nigrocristatus*), *Idiotes* (for *rufifrons*) and to propose a new genus, *Phaeothlypis* (p. 8), for *fulvicauda* and its allies.

He also shows that the genus *Basileuterus* Cabanis is really, according to a strict interpretation of the rules, a synonym of *Helmitherus* Rafinesque by virtue of *Sylvia vermivora* Vieillot being the only species cited. He however proposes to take as the type *B. auricapillus olivaceus*, which bears a remarkable resemblance to *Helmitherus vermivorus* and was, he thinks, the bird that Cabanis had in mind, and so retain the time-honored name which has been fortunate in escaping any synonyms.

The author recognizes six forms of *Phaeothlypis* belonging to three species; thirty-two of *Basileuterus* arranged in twenty-four species and five of *Idiotes* all subspecies of *rufifrons*.

New forms described are *P. semicervina annexa* (p. 15) Pomara, northern Peru; *B. castaneiceps chapmani* (p. 32) Chaupe, northern Peru; *B. coronatus notius* (p. 33) Yungas, Bolivia; *B. c. elatus* (p. 35) Chunchi, Ecuador; *B. c. regulus* (p. 36) Paramo de Rosas, Venezuela; *B. signatus flavovirens* (p. 45) Incachaca, Bolivia.

Through the coöperation of other institutions Mr. Todd had before him for study no less than 2615 specimens which gives some idea of the thoroughness of his investigation.—W. S.

Mathews' 'Systema Avium Australasianarum.'—The present list[2] of the birds of the Australian Region represents the results of the years of research that Mr. Mathews spent upon the subject during the publication of his monumental 'Birds of Australia' as well as such information as he has accumulated since the completion of that work. As is well known, as the years went by and his several lists of Australian birds were published, his views, both as to subspecies and genera, underwent many a change and we now have his latest presentation of the subject. In form and typography this volume of the 'Systema Avium' conforms closely to Sclater's 'Systema Avium Ethiopicarum' but instead of limiting the synonymy to the original place of publication Mr. Mathews cites quite a number of references for many of the forms, moreover no English names are given for any of the species or subspecies.

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[1] A Revision of the Wood-Warblers Genus Basileuterus and its Allies. By W. E. Clyde Todd, Proc. U. S. Nat. Museum, Vol. 74, Art. 7, pp. 1–95, 1929.

[2] Systema Avium Australasianarum. A Systematic List of the Birds of the Australian Region. By Gregory M. Mathews, F. R. S. E., M. B. O. U. Prepared in conjunction with Special Committees of the British and American Ornithologists' Unions. Part I, pp. 1–426. June 13, 1927. Weldon and Wesley Ltd., 2–4 Arthur Street. New Oxford Street, W. C. 2. 1927.

Both of these works cite the binomial name at the head of the several trinomials where a species is divided into subspecies, as was done, in the last 'A. O. U. Check-List' but which was found in our experience to be more misleading than beneficial to the general reader, and really unnecessary, as the repetition of the specific name in each of the trinomials clearly indicates their association in specific groups.

While there are but few families in which identical species occur both in Africa and Australia, the names of such wide ranging birds are usually the same in the two lists although Mr. Mathews' extreme subdivision of genera now and then necessitates a different generic name. At all events even if the nomenclature of the several volumes of the 'Systema' is not entirely uniform we shall have a set of volumes based upon the same general principles and prepared on the same general plan which is a big step toward uniformity.

Mr. Mathews deserves the thanks of all ornithologists for the care and thoroughness of his list and for the amount of nomenclatural matter that he has brought to light in his years of study of ornithological literature and which has helped those interested in the birds of many other countries besides Australia.—W. S.

The Illinois Audubon Bulletin.—When we find this always well printed and attractive publication[1] on our desk awaiting review we regret that its publishers do not adopt some distinctive title such as we have suggested above. As it is, in libraries, catalogues and indexes of literature, where exact quotation of title is necessary, it must appear as "The Audubon Bulletin" for there is no indication as to where it is published except at the bottom of the cover which is not part of the title.

The present issue is no exception to its predecessors in interest. There is a well written opening article by Chreswell J. Hunt, former secretary of the Delaware Valley Ornithological Club, on the song of the Pine Warbler, which he learned to know in his former haunts in the New Jersey Pine Barrens; Photographing the Least Bittern is the title of a paper by A. M. Bailey; an account of the A. O. U. Meeting in Charleston is furnished by Ruthven Deane; the passing of the Passenger Pigeon is described by H. P. Ijams and there are numerous local notes on birds and trees. One of these describes a flight of Broad-winged Hawks passing overhead on December 19, 1927. There is no indication as to where this observation was made but if it was in the Chicago region we would suggest that there is either a mistake in the date or in the identification of the birds. Such flights of Broad-wings are common in September and October but by December these Hawks are in their winter quarters in South and Central America and we have no definite record of their occurrence in mid-winter so far north. Furthermore such Hawk flights of any species are over, so far as our knowledge goes, long before this date, but these birds might possibly have been one of the wintering species of *Buteo*.—W. S.

[1] The Audubon Annual Bulletin. Published by the Illinois Audubon Society. No. 19, 1928. pp. 1–63.

Sass's 'On the Wings of a Bird.'—Those of us who delight in penetrating to the heart of wood and swamp or in scouring the river shore or ocean beach in search of bird-lore, likewise delight in the accounts of the experiences of others, in similar pursuits, when written with the power and charm that create vivid pictures before our mind's eye. Such a writer is Herbert Ravenel Sass and in his recent book 'On the Wings of a Bird'[1] one may visit with him his favorite haunts in the South Carolina low lands and share his delight in the study of the native birds of the Palmetto State.

The opening chapter takes the name of the book or rather *vice versa*; then follow accounts of the White Ibis, the Wood Ibis, the Bald Eagle, the Wild Turkey, which Mr. Sass terms appropriately "our other national bird," and the White Egret—"Herodias the White." While paying especial attention to birds, our author, like a true naturalist, does not ignore other kinds of life and we have a chapter on alligators and another on sharks and sea turtles, while in "The Magic of Still Waters" and "The Watcher in the Woods," we have delightful pictures of nature and wild life in general. This is a book that all lovers of nature should possess. —W. S.

Delamain's 'Pourquoi les Oiseaux Chantent.'—This little work[2] in its 16th edition is one of the series published under the direction of the author and with the title "Les Livres de Nature."

It consists of a series of sketches of bird life in France, the titles of which will give one an idea of the contents: Why the Birds Sing; The Spring Migration; Loves and Hates; The Nuptials; The Round of the Titmice; The River; Nature's Larder; The Autumn Migration and the History of a Family of Montague's Harriers.

This little volume will appeal to all bird lovers and those who may wish to improve their French, will find it a most attractive medium for the purpose. Incidentally in the same series are French translations of Seton's 'Lives of the Hunted,' Stewart Edward White's 'The Forest' and Will James' 'Smoky.'—W. S.

Henry and Wait on the Birds of Ceylon.—This collection of colored plates of the birds of Ceylon[3] was described in a notice in 'The Auk' for April, 1928, p. 240. The second part has now appeared which is in all respects equal to the initial number; the color reproductions of Mr.

[1] On the Wings of a Bird. By Herbert Ravenel Sass. Illustrated by Herman Palmer. Doubleday, Doran & Company, Inc., Garden City, New York. 1929. pp. 1–334. Price $2.50.

[2] Pourquoi les Oiseaux Chantent par Jacques Delamain. Préface de Jérome et Jean Tharaud. 16th edition. Librairie Stock. Delamain et Boutelleau Paris, 7, Rue du Vieux-Colombier, Paris. Price 12 frs.

[3] Coloured Plates of the Birds of Ceylon. By G. M. Henry with a short description of each bird by W. E. Wait. Part II, with sixteen coloured plates. Published by the Ceylon Government. 1928. Price per part £1.10. Dulan & Co. Ltd., 32 Old Bond Street, London, W. I.

Henry's paintings are excellent and the brief text to each plate satisfactory and well printed.

The species figured in this part are the Blue Nuthatch; the Iora (*Aegithina*); Ceylon Blackbird (*Merula*); Whistling Thrush (*Arrenga*); Black-naped Flycatcher (*Hypothymis*); Wood Shrike (*Tephrodornis*); Racket-tailed Drongo (*Dissemurus*); Fan-tailed Warbler (*Cisticola*); Munia (*Uroloncha*); Legge's Flower-pecker (*Acmonorhynchus*); Pygmy Woodpecker (*Yungipicus*); Layard's Woodpecker (*Chrysocolaptes*); Jungle Nightjar (*Caprimulgus*); Pompadour Pigeon (*Treron*); Ceylon Wood Pigeon (*Columba*); and Bustard Quail (*Turnix*).—W. S.

Pellet Formation and Nesting Habits of the Barn Owl.—In the fourth number[1] of the 'Encyclopedie Ornithologique' the formation, mechanism of expulsion, physical form and composition, and number of pellets ejected daily is discussed for birds in general with special reference to feeding experiments with *Corvus corone* and *Tyto alba perlata*.

The author and M. Madon examined over 1700 whole pellets and an indefinite amount of unconsolidated pellet material of the common Barn Owl. The results obtained differ from those of former investigators in the greater proportion of rodents found. Percentages secured by averaging the findings from 4 lots of pellets ejected at varying times and places by different individuals show that rodents numerically form 58.98 per cent, insectivores, 21.05 per cent; tabrachians, 16.30 per cent; birds, 0.65 per cent, and saurians a trace, of the food items. The conclusion is that this owl merits diligent protection.

The balance of the volume is devoted to a journal of 220 days of observation of the nesting habits of the Barn Owl. Commencing with the selection of a pigeon house as a suitable domicile, the coming of the mate, laying of the eggs, brooding, hatching of the young, their growth and departure from the nest were recorded daily by the painstaking observer. In the journal the daily catch, number, species, sex and weight of prey is noted. Certain marked foods were weighed and left in the nest shelter, the pellets containing them subsequently being collected and weighed. The nestlings were weighed daily from first appearance until they became unmanageable, a period varying from 31 to 44 days for the five birds. In addition the weights of a series of eggs and of adults are included.—PHOEBE KNAPPEN.

Shorter Papers.

Bangs, Outram.—The Chinese Forms of Seicercus of the Burkii Form-Circle. (Proc. New Engl. Zool. Club, Vol. XI, pp. 1–5, May 8, 1929.)—Three species recognized; *cognitus*, *intermedius* and *burkii* the last divided into four subspecies *S. b. latouchei* (p. 4) Kuatun, n. w. Fohkien deing described as new.

[1] La Vie des Chouettes. Régimes et croissance de l'Effraye commune *Tyto alba alba* (L.) en Vendée. By G. Guérin. Encycl. Orn. France. No. 4, 157 pp., 10 pls., 1928.

Bannerman, David.—A Further Note on the Genus Lampribis. (Novit. Zool., Vol. XXXV, pp. 78–81. January, 1929.)—By assembling the types of most of the species of this group Dr. Chapin's surmises as to their relationship have been confirmed, but the present author prefers to regard *akleyorum*, *bocagei* and *rothschildi* as subspecies of *olivacea*. *L. splendida*, as Chapin suspected, is a synonym of the last.

Chapman, F. M.—Descriptions of New Birds from Mt. Roraima. (Amer. Mus. Novitates., No. 341, pp. 1–7, February 2, 1929.) *Columba albilinea roraimae* (p. 1); *Systellura ruficervix roraimae* (p. 2); *Trogonurus personatus roraimae* (p. 3); *Elaenia dayi* (p. 3), very distinct from any known species; *Compsothlypis pitiayumi roraimae* (p. 4); *Brachyspiza capensis roraimae* (p. 5); *Coereba guianensis roraimae* (p. 6).

Conklin, W. G. and Morton, J. N.—More Food for Upland Game.—A pamphlet of the Pennsylvania Game Commission describing food distributing devices for game birds, well illustrated and with a color plate of the Turkey by Sutton on the cover.

Cooke, May Thacher.—'The Spread of the European Starling in North America' (to 1928) (Circular No. 40, U. S. Dept. Agr., Nov., 1928, pp. 1–9, 1 pl. Price 5 cts. Supt. Documents, Gov't. Printing Office). This report brings Miss Cooke's previous publication (1925) up to date. The bird is now recorded over most of the United States east of the Mississippi River. The breeding range where it is sufficiently abundant to constitute an economic problem extends from southern New England to Virginia and west to central Pennsylvania and western New York.

Davidson, M. E. McLellan.—On a Small Collection of Birds from Torres Strait Islands, and from Guadalcanar Island, Solomon Group. (Proc. Calif. Acad. Sci., Vol. XVIII, No. 10, pp. 245–260, April 5, 1929.)—A Collection of 138 skins representing 57 species made by Mr. J. August Kusche and now in the California Academy. No new forms described.

Griscom, Ludlow.—A Collection of Birds from Cana, Darien. (Bull. Mus. Comp. Zool., Vol. LXIX, No. 8, pp. 149–190. April, 1929.)—Report on a collection made by Rex R. Benson in 1928 which consisted of 610 specimens representing 193 species. The following are described as new: *Tinamus major saturatus* (p. 150) Cana; *Odontophorus guianensis chapmani* (p. 153) Cana; *Butorides striatus patens* (p. 156) Panama City; *Ciccaba virgata centralis* (p. 159) Chivela, Oaxaca, Mexico; *Trogon collaris extimis* (p. 162) Cana; *Eubucco bourcieri anomalus* (p. 163) Cana; *Chrysoptilus punctigula lucescens* (p. 165) El Real, e. Panama; *Myrmotherula brachyura ignota* (p. 167) Jesusito, e. Panama; *Dechonychura typica darienensis* (p. 172) Cana; *Leptopogon superciliaris troglodytes* (p. 174) Cana; *L. s. hellmayri* (p. 175) Carrillo, Costa Rica; *Manacus vitellinus viridiventris* (p. 179) Jiminez, w. Colombia; *Pheugopedius spadix xerampelinus*

(p. 182) Cana; *Saltator maximus iungens* (p. 184) Cana; *Tersina viridis grisescens* (p. 186) La Concepcion, Santa Marta. A third specimen of *Praedo audax* Nelson is discussed and the genus considered identical with *Aphanotriccus*.

Hadley, Alden H.—The Legal Status of Hawks and Owls; A Statistical Study. (Trans. 15th Nat. Game Conference, pp. 41–48.)

Mr. Hadley, on behalf of the National Association of Audubon Societies, sent out, to game commissioners of states in which protection is given to certain Hawks and Owls, a questionnaire asking if they considered the law capable of enforcement; whether magistrates showed a disposition to enforce it and whether convictions had been obtained. Thirty-nine replies were received; only three considered the law capable of being enforced; eleven were sympathetic and twenty-five emphatically against such a law.

Inasmuch as most Game Commissions are today, unfortunately, the enemies of the Hawks and Owls a questionnaire to such organizations does not seem to amount to much as an index of public opinion, but as all matters of bird protection are in the hands of Game Commissions whether they refer to game or non game birds there seems no hope for our raptorial species. It is all very well to claim that it is a matter of education, but the birds will be exterminated before we can educate the public, especially when Game Commissions are educating them in the other direction. It would seem therefore that the case of the Hawks and Owls is hopeless.

Harper, Francis and Harper, Jean S.—Animal Habitats in Certain Portions of the Adirondacks. (New York State Museum Handbook, No. 8, 1929.) This is an interesting and valuable summary of the characteristic species of trees, plants, birds and mammals of the various habitats of the Adirondack Mountains. It will be especially valuable for comparison with other regions in the East.

Johnsen, Sigurd.—Dratskiftet hos lirypen (*Lagopus lagopus*) in Norge. (Bergens Museums, Arbok 1929.)—This is a most elaborate discussion of the plumage changes in this Ptarmigan with a series of colored and plain plates showing the various stages. The author is not convinced that the white winter plumage is purely protective and points out that it is heavier and the down more extensive while the minute air globules which produce the white color also make it warmer. There is a good bibliography, and an English summary.

Lincoln, F. C.—What Constitutes a Record. (Bull. Aud. Soc. New Hampshire. Vol. 8, No. 2. December, 1928.)—This is an oft discussed question and even though Mr. Lincoln feels that a "record" should be based on an actual specimen obtained, we do not think that the matter is closed. Sight records will continue to be published in reputable journals and we fear that the compilers of lists will be unable to formulate any hard

and fast method by which they may decide which to accept and which to reject. The editor of such a journal is in the same predicament and even though he exercises what he considers to be the utmost discretion he will inevitably err in accepting some erroneous "records." However, the reputation and ability of the observer is after all our best basis for judgement. If, for instance, Mr. Lincoln, with his wide experience, should see a rare bird, such as a Wilson's Phalarope, in the country about Washington, where it is unrecorded, and should send an account of his observation to 'The Auk' we should unquestionably accept it, but if some beginner unfamiliar with shore birds should submit a similar observation we should decline it with thanks.

Sight records must, we fear, involve the personal equation and certain other considerations. We must not forget, moreover, the part that binoculars play in practically putting a bird in arms' reach which formerly was far away, and also the greatly increased opportunity of correctly identifying birds which the numerous popular books and accurate pictures of today offer. At the same time the over ambitious amateur should be extremely careful. If he sends one fantastic "record," that cannot be substantiated, to a reputable journal, his future contributions are likely to be looked upon with suspicion for some years to come. With all their incentives the competitive "daily lists" and the "life list" seem to be deadly menaces to accurate observation.

Metcalf, Maynard M.—Parasites and the Aid they Give in Problems of Taxonomy, Geographical Distribution and Palaeontology. (Smithson. Misc. Collns. Vol. 81, No. 8, pp. 1–36, February 28, 1929.)—The presence of the same species of mallophaga on related European and American species of birds, and of closely related or identical forms on various species of Ratitae are cited in the general discussion of the subject, usually from papers by Vernon L. Kellogg and Launcelot Harrison.

Meylan, O.—Notes sur les Oiseaux des environs de Genève. (Bull. de la Societe Zool. de Geneve, Vol. IV, Fasc. 1, February, 1929.)—An annotated list of the birds of Geneva with dates of observation and notes on habits.

Mitchell, Charles A. and Duthie, R. C.—Tuberculosis in Crows. (Amer. Review of Tuberculosis, Vol. XIX, No. 2, 1929.)—Account of an epidemic in western Ontario and experiments to see if infection is likely to be carried by the birds to other animals.

Peters, Harold S.—Mallophaga from Ohio Birds. (Ohio Jour. Science, Vol. XXVIII, No. 4, July, 1928.)—An account of the habits of these "lice" and methods of preserving and studying them. There are today about 1700 described species representing some 70 genera, of which 94 species and 24 genera have been found on Ohio birds. A list of these species and their hosts is appended. The importance of the study

of these parasites in shedding light on the relationship of various birds is referred to above (see Metcalf).

Peters, James L.—The Identity of Corvus mexicanus Gmelin. (Proc. Biol. Soc. Washington, Vol. 42, pp. 121–124, March 25, 1929.)—Mr. Peters has unearthed a most unfortunate case of misidentification with far reaching effect upon nomenclature. Fernandez described a Mexican bird which he called "Hoitzanatl" and to which Gmelin gave the Latin name of *Corvus mexicanus*. Subsequent authors, without looking up the original description, took Gmelin's action as authoritative and applied his name to the Mexican Crow. It now turns out that the "Hoitzanatl" is nothing more than the Great-tailed Grackle, a common Mexican bird and the name *macrourus* universally applied to it must be changed to the earlier *mexicanus*. This is bad enough but it is not all. Lesson in 1831 proposed the genus *Cassidix* apparently for the Rice Grackle but included in it Gmelin's *Corvus mexicanus* which Gray later designated as the type of the genus, thus transferring this generic name, also, to the Great-tailed Grackle. A new generic name is therefore needed for the Rice Grackle and *Psomocolax* (p. 123) is supplied by Mr. Peters. One race of Rice Grackle, moreover, has been called *mexicanus* Lesson, but this name being of the same origin as *Corvus mexicanus* Gmel. is not available and a new name *impacifus* (p. 123) is proposed for it, while for the Mexican Crow, also deprived of its old name, *imparatus* (p. 123) is proposed.

Peters, James L.—Vertebrates from The Corn Islands [Introduction and Birds] (Bull. Mus. Comp. Zool., Vol. LXIX, No. 7, pp. 127–146).—This is an account of a visit paid by the author and Mr. Edward Bangs to the Corn Islands in the western Caribbean Sea which curiously enough had never been visited by naturalists. The results were disappointing as it was found that there was not only no characteristic avifauna, but the islands were almost devoid of birds. A list of thirty-five forms is given, seven being North American migrants and the rest mainly water birds. The breeding species were the Ani, Mangrove Cuckoo, White-crowned Pigeon and possibly a Coot and some Herons.

Reid, Russell and Gannon, Clell G.—Natural History Notes on the Journals of Alexander Henry. (North Dakota Historical Quarterly, Vol. II, No. 3, pp. 168–200, April, 1928.)—An interesting series of extracts from the Henry Journals published in 1897 under the editorship of Elliott Coues. All references to mammals and birds have been transcribed and identified in present day nomenclature. The same authors performed a similar service, in 1927, in connection with the North Dakota notes in Lewis and Clarke's Journals (see 'Auk' 1928, p. 120).

Riley, J. H.—Descriptions of four new Birds from the Mountains of Northern Siam. (Proc. Biol. Soc. Washington, Vol. 42, pp. 161–164. May 3, 1929.)—*Niltava grandis nobilis* (p. 161) Doi Angka; *Niltava*

smithi (p. 162) Doi Sutep; *Zosterops palpebrosa vicina* (p. 162) Doi Sutep; *Aethopyga nipalensis angkanensis* (p. 162) Doi Angka.

Riley, J. H.—A Review of the Birds of the Islands of Siberut and Sipota Mentawi Group (Spolia Mentawiensia) (Proc. U. S. Nat. Mus. Vol. 75, Art. 4, pp. 1–45, pl. 1, 1929.)—This report is based upon a collection made by C. Boden Kloss, which has already been reported upon by Messrs. Chasen and Kloss (Ibis, 1926, pp. 269–306), but which was sent to Washington in order that it might be compared with the collections from neighboring islands made by Dr. W. L. Abbott. Three new forms have already been named by Mr. Riley (Proc. Biol. Soc. Washington, Vol. 40, pp. 95–96).

Salomonsen, Finn.—Bemerkungen über die Verbreitung der *Carduelis linaria* Gruppe und Ihre Variationen. (Saertryk af Vidensk. Medd. fra Dansk naturh. Foren Bd. 86, 1928, pp. 123–202.)—A detailed study of the Redpolls in which the author reaches conclusions different from those expressed in the A. O. U. 'Check-List.' He regards all forms as races of *A. l. linaria*, recognizes *A. l. fuscescens* Coues, from Labrador and eliminates *A. l. holboelli* from America.

Schestakowa, Miss G. S.—Die Entwicklung der distalen Muskulatur des Vogelflügels, and Die Entwicklung des Vogelflügels. (Bull. Soc. Nat. de Moscou, 1927.)—Two important papers on the structure of the bird's wing and the arrangement of the muscles published in German and Russian. Miss Schestakowa is a pupil of Prof. Michael Mentzbier of Moscow, under whose direction the work was done.

Snyder, L. L.—Winter Birds of Toronto. (Bull. Royal Ontario Museum of Zoology, No. 2, January, 1929.)

Swarth, H. S.—The Faunal Areas of Southern Arizona: A Study in Animal Distribution. (Proc. Calif. Acad. Sci., Vol. XVIII, No. 12, pp. 267–383, April 26, 1929.)—Report on a field trip to the vicinity of the Santa Rita Mountains, Arizona, May–June, 1927, by the author, Joseph Mailliard and Raymond Gilmore. This mountain range seems to mark the division between the eastern "plains" region and the western "desert" region of southern Arizona and the object of the expedition was to work out the distribution of the characteristic forms of the two areas. Besides the general discussion of the problem there is an annotated list of the 164 birds and 34 mammals that were found by the party.

Zimmer, John T.—New Birds from Peru, Brazil and Costa Rica. (Proc. Biol. Soc. Washington, Vol. 42, pp. 81–98. March 25, 1929.)—Results of a study of the collection made by the Marshall Field Peruvian Expedition. Forms described are: *Xenops rutilus septentrionalis* (p. 82) Guayabo, Costa Rica; *Pipra coronata circumpicta* (p. 84) Munichis, Peru; *Pipra pipra microlopha* (p. 85) Puerto Bermudez, Peru; *Phrygilus unicolor*

inca (p. 88) Huanuco, Peru; *Chlorophanes spiza axillaris* (p. 90) Bahia, Brazil; *Tangara chilensis chlorocorys* (p. 91) Vista Alegre, Peru; *Thraupis episcopus caeruleus* (p. 94) Vista Alegre; *Ramphocelus melanogaster transitus* (p. 95) Chinchao, Peru.

The discussion is very full and replete with information about related forms, distribution, etc., which is very helpful.

Zimmer, John T.—The Birds of the Neotropical Genus Deconychura. (Publ. 257. Field Mus. Nat. Hist., Zool. Series, Vol. XVII, No. 1, pp. 1–18. May 18, 1929.)

A careful review in which two species *longicauda* (with five races) and *stictolaema* (with four races) are recognized.

D. l. pallida (p. 6) Hyutanahan, Brazil; *D. l. connectens* (p. 8) Puerto Bermudez, Peru; and *D. s. clarior* (p. 14) Pied Saut, French Guiana are described as new.—W. S.

The Ornithological Journals.

Bird-Lore. XXXI, No. 2. March–April, 1929.

The Loon at Close Range. By Dr. Frank N. Wilson.—An intimate account of the habits of nesting Loons with some remarkably fine photographs of the female and nest.

Bird-Life at an Iowa Mill Pond. By Fred J. Pierce.—Notes on Cormorants, Ducks, Grebes, etc.

Flycatcher Habitats. By. J. T. Nichols.

Dr. A. A. Allen, in the Audubon Department, has an account of the Chipping Sparrow, illustrated by some of his exquisite photographs, while the colored plate figures the Three-toed Woodpeckers from a painting by Sutton.

Bird-Lore. XXXI, No. 3. May–June, 1929.

Robert Ridgway. By Frank M. Chapman.—An appreciation and reproduction of a letter written only a little more than a month before his death, with a recent photograph.

A Cedar Waxwing in Northern Michigan. By William A. Gross.—With admirable photographs of the birds and nest.

Warbler Ways. By Roger T. Peterson.—Photographs of Mourning and Chestnut-sided Warblers and Maryland Yellow-throat.

Dr. A. A. Allen has an excellent account of the life history of the Kingfisher, illustrated, and there is a colored frontispiece of the Blue-gray Gnatcatcher by Brooks.

The Condor. XXXI, No. 2. March–April, 1929.

Down-Tree Progress of Sitta pygmaea. By J. Eugene Law.—A most interesting and original study of this Nuthatch showing that the body is almost always held at right angles to the trunk with one foot supporting it from above and the other holding it away from the tree. A series of remarkable photographs illustrate the article.

Notes on the Feeding Habits and Behavior of the California Clapper Rail. By Laidlaw Williams.—Another admirable study of bird habits with excellent photographs of feeding birds.

The Harris Sparrow in Central Oklahoma. By Margaret Morse Nice.

Notes on Water Birds at Morro Bay, California. By Joseph Grinnell and Richard Hunt.

The Condor. XXXI, No. 3. May–June, 1929.

Comparative Studies in the Growth of Young Raptores. By E. L. Sumner, Jr.—Cooper's Hawk, Western Red-tail, Golden Eagle, Sparrow Hawk, Barn Owl, Long-eared Owl, Screech Owl and Pacific Horned Owl.

Notes on the Food Habits of Certain Raptores in British Columbia and Alberta. By J. A. Monro.

The Status of the Ring-necked Pheasant in Utah. By Clarence Cottam.—Including analysis of the food of forty-five individuals.

The Wilson Bulletin. XLI, No. 1. March, 1929.

In the Haunts of the Wood Ibis. By Ernest G. Holt.—An excellent life history of this interesting bird in southern Florida with many photographs and a colored plate from a painting by Sutton.

The Mechanical Execution of Wilson's "American Ornithology." By Frank L. Burns.—A most interesting historical account containing much original information.

The Hungarian Partridge in Northwestern Iowa. By Chas. J. Spiker.

Some Shorebird Records for the Miama Valley, Ohio. By Ben J. Blinco.

Birds of Little Egypt. By A. R. Cahn and A. Sydney Hyde.—An ecological account of the birds of southernmost Illinois.

The Oölogist. XLVI, Nos. 1–4. January–April, 1929.

Bonaparte's Gulls in Unusual Numbers. By W. E. Saunders.—On Lake Erie, where 2500 were seen in August, 1928, and 5000 on November 12. [January].

Breeding Dates for Birds of Tulsa Co., Oklahoma. By G. W. Morse.—[February, see also March].

The Vanishing Glory of Great Egg Harbor Bay Region, New Jersey. By Frank L. Burns.—A well written historical account, and while conditions bid fair in a few years to be as bad as Mr. Burns describes them, due to the activity of "developments" and dredging, they are not so bad at present. There are several thriving colonies of Black Skimmers and Common Terns breeding along the southern New Jersey coast a colony of some 30 Least Terns, one or two pairs of Roseate Terns and scattered Piping Plover while the Little Blue Herons now appear in spring as well as in late summer and may breed. [March].

Nesting of the Long-eared Owl in Pennsylvania and New Jersey. By R. F. Miller. [March].

Bulletin of the Essex County [Mass.] Ornithological Club. No. 10, December, 1928.

The Ipswich Crow Roost and the Great Horned Owl. By Charles W. Townsend.

Four Days in May, 1928, in Essex County. By Ludlow Griscom.—96, 90, 100 and 112 species seen on the four days.

Ipswich River Trip. By Ralph Lawson.—106 species seen on May 19.

Essex County Shooting Season of 1928. By John C. Phillips.

Moults and Plumages of the Starling (*Sturnus vulgaris*). By James L. Peters.

A Pine Tree State Ornithologist among the Palms and Mangroves. By Sanford Ritchie.—A diary of observations in Florida.

Annotated List of Birds Observed by the Club during 1928.

Bulletin of the Northeastern Bird-Banding Association. V, No. 2. April, 1929.

Edward Howe Forbush. By John B. May.

Recoveries of Common Terns Banded at Chatham, Mass. By Charles B. Floyd.—17,000 birds of the year banded and only 33 recoveries. These were from Newfoundland, Maine, New Jersey, Virginia, Florida, Porto Rico, San Domingo, Trinidad, Venezuela and Brazil.

Systematic Ornithology and Bird Banding. By James L. Peters.

Longevity of the Blue Jay. By E. C. Hoffman.—The average life of a Blue Jay seems to be less than two years and only about three in a hundred apparently live long enough for a fourth nesting.

A Preliminary List of Migratory Species which Return to the Same Wintering Area. By Wendell P. Smith.

Further Observations on the Black-throated Blue Warbler. By Katherine C. Harding.

The Ibis. (Twelfth Series). V, No. 2. April, 1929.

On the Birds Collected during the Fourth Expedition to French Indo-China. By J. Delacour.—List of Species and subspecies, with notes by P. Jabouille and W. P. Lowe.

A Contribution to the Ornithology of the Coastland of British Guiana. By Charles G. Young.—Part III.

On the Nestling of *Odontophorus speciosus*. By Einar Lönnberg.

A New Race of *Troglodytes rufociliatus* from El Salvador. By Donald R. Dickey and A. J. vanRossem.—*T. r. nannoides* (p. 265).

Field Notes on a Collection of Birds from Uganda. Part III. By H. F. Stoneham.

On the Birds Collected by Mr. H. Stevens in Northern Tonkin. Part II. By N. B. Kinnear.

Bulletin of the British Ornithologists' Club. CCCXXX. March 8, 1929.

W. L. Sclater reviews the races of *Erythropygia leucophrys* describing as new *E. l. vansomereni* (p. 62) from Ruwenzori. Stuart Baker proposes *Pericrocotus cinnamomeus iredalei* (p. 64) from Ambala, for *peregrinus* auct.

There is an interesting paper by Dr. P. H. Manson-Bahr on 'Ornithology as an Aid to Medical Science,' discussing the part that birds play in various diseases such as malaria, beri-beri, etc.

Bulletin of the British Ornithologists' Club. CCCXXXI. March 26, 1929.

Aegithalos caudatus aremoricus (p. 87) Loudiac, Brittany, is described by H. Whistler.

Bulletin of the British Ornithologists' Club. CCCXXXII. April 25, 1929.

G. L. Bates proposes *Jubula* (p. 90) as a new genus for *Bubo lettii*. G. M. Mathews describes *Munia atricapilla novana* (p. 91) from Cape York, Australia.

Bulletin of the British Ornithologists' Club. CCCXXXIII. May 27, 1929.

An exhibition was made of 103 hybrid ducks from the Tring Museum and 30 from the British Museum. All are listed.

A. F. Griffith read some notes on Shetland birds.

British Birds. XXII, No. 10. March, 1929.

A List of the Birds of Inner London. By A. H. Macpherson.—An area two and a half by four miles containing a densely populated district along with most of the central parks. No less than 126 species have been observed since 1900 of which 21 now breed. There is a fully annotated list.

Ornithological Report from Norfolk. By B. B. Reviere.

The "British Birds" Marking Scheme. By H. F. Witherby.—States the progress made in 1928 when 24,479 birds were banded.

British Birds. XXII, No. 11. April, 1929.

Report on the "British Birds" Census of Heronries. 1928. By E. M. Nicholson. Concluded in the May issue.—A most interesting report which will be separately reviewed in our next issue.

Avicultural Magazine. VII, Nos. 3, 4, 5. March to May, 1929.

Colored plates represent *Nectarinia pulchella*, *Ptilinopus wallacii* and *Alectroenas pulcherrima*, in the three issues respectively.

J. Delacour discusses Fruit Pigeons in all three and T. H. Newman has an article on Bronze-winged Doves and Pigeons in May.

J. Bradshaw discusses Inheritance of Colour in Budgerigars in March which calls forth other papers in the following issues.

There is an interesting account of an "educated" Parakeet and a paper on aviculture in America, in March.

The Oölogists' Record. IX, No. 1. March, 1929.

J. H. Bowles Collection of N. A. Nests and Eggs.—910 species of eggs and 456 of nests.

Notes from the Trans-nzoia District, Kenya Colony. By A. H. Paget-Wilkes.

Breeding of the Northern Pileated Woodpecker [in Pennsylvania]. By Thos. D. Burleigh.

Bird Notes and News. XIII, No. 5. Spring, 1929.

While keeping us informed on the progress of bird protection in Great Britain this journal contains many other interesting notes among which is an 'Interview with a Lyre-Bird' by H. H. A. Dombrian, with two illustrations.

The Emu. XXVIII, Part 4. April, 1929.

The Brown Bell Magpie. By E. Ashby.

The Birds of Port Stephens, N. S. W. By A. H. Chisholm and N. W. Cayley.—Many photographs.

List of Birds of Canberra, The Federal Territory. By D. P. Jones.

Collecting and Non-collecting. By E. A. D'Ombrian.

Bird Protection in Australia. By J. R. Kinghorn.

The Economic Value of Birds. By L. L. LeSouef.

The above papers and a report of the R. A. O. U. Committee on the subject cover a matter that is causing serious discussion among the Australian ornithologists and bird lovers. Whether collecting, except for the museums, is going to be tolerated seems to be an open question, but at the same time the difficulty of enforcing laws is pointed out. Almost the same condition is faced in America.

The Vicissitudes of a Noddy. By Tom Iredale.—A specimen of *Procelsterna albivitta* Bonap. found on the beach north of Sydney which places it definitely on the Australian list. Some, however, have questioned the inclusion of dead birds washed up by the tides as "records."

The Swift Parrot in Tasmania. By R. W. Legge.

Glimpses of Bird-life in Cradle Valley. By H. S. Dove.

Notes on Eggs of Australian birds are contributed by G. M. Mathews.

Bird Migration in New Zealand. By Mrs. P. Moncrieff (continued).—A very fully annotated list.

The reports of the general and local secretaries presented at the recent meeting of the R. A. O. U. are published in this issue.

The South Australian Ornithologist. X, Part 2. April, 1929.

Birds noted in the Port Augusta and Hawker Districts. By J. B. Cleland.

A Trip to the South-east of South Australia. By J. Sutton.

Revue Francaise d'Ornithologie. No. 235. December 7, 1928. [In French].

Geographic Variation of *Parus ater* in Western Europe. By H. Jouard.

The Propagation of Mistletoe by Birds. By N. May and another paper on the same subject by H. Heim de Balsac.

[Combined after this issue with 'L'Oiseau'.]

L'Oiseau. IX, No. 12, and X, Nos. 1 and 2. December, 1928—February, 1929. [In French.]

General article on Pigeons. By T. H. Newman.—With colored plate of *Columba speciosa.* [December.]

Revision of the Genus *Cissa.* By J. Delacour.—Colored plate of *C. hypoleuca chauleti* [January]. There are also many papers on aviculture with a photograph of *Guttera lividicollis* Ghigi.

The Gray Partridge (Perdix perdix) in the Basses-Cevennes. By A. Hugues [February].

On the Variation in Plumage in Birds. By J. Delacour and M. Hachisuka [February].—Divided into phases of coloration, aberrations, polymorphisms and mutations.

The Pittidae of Indo-China. By J. Delacour. [March.]

To the Heart of the Basque Country. By A. Rochon-Duvigneaud. [March.]

Observations on the Birds of Scandinavia. By J. Berlioz. [March.]

On the Bustards of the Soai-Rieng Region (Cambodge). By P. Jabouille. [March.]

Biographies of Three French Ornithologists.—Jean-Jacques, Armand and Albert Marchand. By Rene d'Abade. [April.]

Note on the Names of the Bankiva Cock. By J. Delacour.

With the March issue this journal combined with 'Revue d'Ornithologie.'

Alauda. I, No. 1. April, 1929. [In French.]

Note on the Common Crossbill. By P. Paris.

Birds and Marine Worms, especially the Nereids. By O. Madon.

On the Geographic Variation of Parus cristatus in Western Europe. By H. Jouard.—*P. c. poeninus* (p. 36) Plateau Monyana-Vermala, Alps; *P. c. abadiei* (p. 37) Brittany; *P. c. albifrons* (p. 38) Pyrenees; and *P. c. heimi* (p. 38) Maritime Alps; are proposed as new.

Observations on Birds of the Southern Environs of Paris and on the Same Species in Paris. By P. Estiot.

Journal für Ornithologie. LXXVII, Heft. 2. April, 1929. [In German.]

The Breeding Habits of the Little Rail (*Porzana parva*). By G. Shiermann.

A Visit to the Bird Island Heinasaaret on the north Finnish Coast. By Walther Emeis.

New Forms from East Siberia. By B. Stegmann.—*Chloris sinica chabarovi* (p. 247); *Lanius cristatus confusus* (p. 248); *Dumeticola thoracica suschkini* (p. 249); *Phragmaticola aëdon rufescens* (p. 250).

Review of the Forms of *Sylvia currica.* By S. Snigirewski.—*S. c. jaxartica* (p. 258), Perowsk (Ssyr-Darja) is described as new.

Mating Display and Sexual Selection in the Ruff. By E. Selous.—With remarks by the translators and editors, H. Culemann and F. Steinbacher.

On Geographic Variation in the Crimson Finch, *Erythrina erythrina*. By W. W. Stantschinsky.—*E. e. setshuanica* (p. 311) Setshuan, China; *E. e. diamesa* (p. 312) northern Mongolia; and *E. e. pallidorosa* (p. 313) Taschkent are described as new.

New Accounts of the Nesting of Birds in the Volga Delta and the Adjacent Steppes. By K. A. Worobiew.

A Collection of Birds from Kwangsi. By E. Stresemann.—*Pomatorhinus swinhoei abbreviatus* (p. 333); *Minla ignitincta sini* (p. 333); *Sasia ochracea kinneari* (p. 335); *Cyanops faber sini* (p. 336); *Pyrotrogon erythrocephalus rosa* (p. 336).

Ornithologische Monatsberichte. 37, No. 2. March, 1929. [In German.]

A Contribution to the Question of the Distribution of *Saxicola torquata rubicola* in northwestern Germany. By H. W. Culemann.

In General Notes *Ninox fusca plesseni* is described as new from West Alor (p. 47).

Ornithologische Monatsberichte. 37, No. 3. May, 1929. [In German.]

On the Resistance of Birds to Atropin. By H. Schildmacher.

Sitta canadensis bangsi (p. 74) and *Phylloscopes trochiloides obscuratus* (p. 74) from N. Kansu are described by E. Stresemann and *Eremomela griseoflava puellula* (p. 75), *Lybius melanopterus didymus* (p. 75) and *Trachyphonus vaillantii suschkini* (p. 76) from tropical Africa, by H. Grote; while O. Neumann describes *Numenius arquata suschkini* (p. 76) from Senegal.

Oceanodroma hornbyi in the Chilian Saltpeter wastes. By E. Stresemann.

Sylvia curruca snigirewskii (p. 83) is proposed by W. S. Stachanow for *S. c. turkmenica*, preoccupied, and W. Meise proposes *Myzomela nigrita ernstmayri* and *M. n. hades* (p. 84) from Allison and St. Mathews Islands respectively.

Beitrage zür Fortpflanzungsbiologie der Vögel. V, No. 2. March 1929. [In German.]

On the Pairing of Ducks. By E. Christoleit.

Observations on an Osprey's Eyrie and on the Rearing of the Young. By R. Kuhk.

Some Observations on the Habits and Breeding of *Perisorius infaustus* in northern Finland. By J. Carpelan.

Oölogical Investigations on some Eggs of Waterfowl. By M. Harms.

Beitrage zür Fortpflanzungsbiologie der Vögel. V, No. 3. May, 1929. [In German.]

Nidological Notes from the Balearic Islands. By A. Koenig.

Breeding Birds of Schleswig-Holstein. By K. O. Beckmann.

Meiteilungen des Vereins sachsischer Ornithologen. II. Sonderheft. April, 1929. [In German.]

On Bernhard Hantzsch's last Journal. By B. Hoffmann.

Vögel ferner Länder. 1928, Nos. 1, 2, and 3. [In German.]

Inheritance of Color in Grass Parakeets. By H. Duncker. [No. 1.]

Speaking Undulated Parakeets. By E. Voigt. [No. 1.]

The Extermination of Birds of Paradise in Dutch New Guinea. By P. Wirz. [No. 1.]

Fertile Hybrids *Spinus spinus* × *Serinus canarius*. By A. N. Prommptoff. [No. 2.]

The Origin of Birds. By H. Weigold. [No. 3.]

Der Ornithologische Beobachter. XXVI, No. 7. [In German and French.]

Bird Life in the Vicinity of Tunis. By A. Masarey. (Continued.)

Recapitulation of the Species of Water fowl at Geneva 1888–1928. By R. Poncy.

Many local notes on Swiss birds.

Le Gerfaut. 18, No. 4. [In French.]

Notes on Belgian birds.

Orgaan der Club van Nederlandsche Vogelkundigen. I, Extra Number. January, 1929. [In Dutch.]

A Synopsis of the Cockatoos. By Snouckaert van Schauburg.

Orgaan der Club van Nederlandsche Vogelkundigen. I. No. 3. March, 1929. [In Dutch.]

New Observations on the Breeding habits of some Javan parasitic Cuckoos. By M. Bartels, Jr.

Many notes on the birds of Holland and of Java, and a critical review of Hachisuka's 'Handbook of the Birds of Iceland.' By Th. G. DeVries.

Tori. VI, No. 27. April, 1929. [In Japanese and English.]

On a Collection of Birds from Paramushir Island, N. Kuriles, Japan. By Y. Yamashima.

Two New Additions to the List of Japanese Birds and Three New Records for the Korean Avifauna. By T. Mori.

A Breeding Place of *Puffinus leucomelas* on Oshima, Hokkaido. By S. Kusu.

Some Rare Anatidae obtained during the Shooting Season, 1928–29, in Japan. By N. Kuroda.

A Nominal List of Anatidae preserved in the Author's Collection. By N. Kuroda. [In English.]

Kocsag. II, No. 1. [Primarily in Hungarian.]

A Brief Sketch of T. Gilbert Pearson [In English, German, French, Italian and Hungarian].

Hungarian Bird Sanctuaries. By M. Foldvary.

Some Woodpecker Experiences in Transylvania. By W. M. Congreve.

The Wall-Creeper (*Tichodroma muraria*). By E. Greschik.—With colored plate.

Nesting of the White Stork in Japan. By N. Kuroda.

There are a number of notes on Hungarian birds. All of the leading articles are reprinted in English and one or more other languages.

Ornithological Articles in Other Journals.

Terrill, L. M. The Brown Creeper and Other Birds Wintering on St. Helen's Island [Montreal]. (*Canadian Field Naturalist*, March, 1929.)

Merriman, R. O. Birds of a Suburban Garden. (*Canadian Field Naturalist*, March, 1929.)

Hantzsch, Bernhard. Contribution to the Knowledge of the Avifauna of Northeastern Labrador. Continued. (*Canadian Field Naturalist*, March, 1929.)

Munro, J. A. Glimpses of Little Known Western Lakes and their Bird Life. (*Canadian Field Naturalist*, April, 1929.)—continued in May.

Taverner, P. A. Bird Notes from the Canadian Labrador. (*Canadian Field Naturalist*, April, 1929.)

Bird, Ralph D. The Great Horned Owl in Manitoba. (*Canadian Field Naturalist*, April, 1929.)—Examination of 109 pellets.

Nash, J. Kirke. The Scarcity of the Corn Crake in the Lothians. (*Scottish Naturalist*, No. 175, January–February, 1929.)

Stenhouse, J. H. Rare Birds at Fair Isle. (*Scottish Naturalist*, No. 175, January–February, 1929.)

Nash, J. K. Starling Roost on Cramond Island. (*Scottish Naturalist*, No. 176, March–April, 1929.)

Peters, J. L. The European Lapwing. (*Bull. Boston Soc. Nat. Hist.*, No. 51, April, 1929.)—Photograph of the single bird to reach New England in the great flight of 1927.

Nichols, John T. On the Edge of the Antarctic Ice. (*Natural History*, March–April, 1929.)—Many excellent photographs of antarctic birds.

Gudger, E. W. Wide-Gab, the Angler Fish. (*Natural History*, March–April, 1929.)—Several instances of the *Lophius* swallowing birds to which should be added the case described by the late Langdon Gibson in 'The Auk.'

Bailey, A. M. Wings along the Gulf. (*Natural History*, May–June, 1929.)—Splendid photographs of Gulls, Terns and Herons.

Hollister, G. and Beebe, Wm. The Secret of the Swallow-winged Puff-bird. (*Natural History*, May–June, 1929.)—Nesting in hole in bank.

Stedman, A. D. The Returning Flight. (*Amer. Forests and Forest Life*, March, 1929.)—S. G. Anderson's preserve for migrant Geese and Ducks at Hutchinson, Minn.

Woods, R. S. The Arizona Junco. (*Amer. Forests and Forest Life*, June, 1929.)

OBITUARIES.

JOSIAH HUNTOON CLARK, an Associate of the American Ornithlogists' Union since 1895, died at Paterson, N. J., May 7, 1928. He was born in Paterson, Dec. 4, 1873, and was 54 years of age at the time of his death. He became interested in birds when about six years old and at the age of eleven a room was set apart for his use where he maintained a collection of Canaries, Parrakeets, Java Sparrows, Strawberry Finches, and other pets. At the age of fifteen or sixteen he began to make reports on the migration of birds for the U. S. Dept. of Agriculture. He was especially interested in oölogy, spent much time in the study of his specimens, and became quite expert in identifying the individual eggs belonging to the same set.

Shortly after his election to the Union he went to Mexico as a mining engineer, where he spent several years in the states of Sonora and San Luis Potosi. He contributed occasionally to the pages of 'The Auk' and some of the results of his field collecting in Mexico appeared in his papers on the nesting of the Curve-billed and Palmer's Thrashers in 'The Auk' for 1898 and 1904. Of the Curve-billed Thrasher he examined more than 100 nests in 1899 and 1900. In later years he was also interested in breeding Poultry and Pigeons, particularly Carneau Pigeons, with which he won the 'Big Cup' in January, 1928. At his death his collection of birds' eggs came into the possession of his brother, Herbert H. Clark, of New York City.—T. S. P.

MRS. ANNE MAUD CHARLESWORTH LEVEY, a life Associate of the American Ornithologists' Union, died at Brookline, Mass., April 23, 1929. She was the widow of the late William Marshall Levey and mother of William Charlesworth Levey, who was an Associate of the Union for several years prior to his death in 1914. Mrs. Levey lived mainly for the memory of her son. A year after his death she joined the Union and became a regular attendant at the meetings in which she took great interest. Through her quiet, gracious manner she made friends all on sides and was personally known to many of the members. A memorial to her son in the form of a pine grove, known as the William Charlesworth Levey Park, was purchased by subscription and deeded, in 1924, to the town of Alton, N. H., their former summer home.—T. S. P.

FREDERICK SHAW MITCHELL of Hornshaw's, Millstream, B. C., who was elected an Associate of the American Ornithologists' Union at the meeting in November, 1928, died after an operation on February 15, 1929, in the seventy-ninth year of his age. He was a Vice-President of the British Ornithologists' Union and one of the oldest members of that organization, having been elected in 1879. He was born in Bury, Lancashire, England, July 29, 1850, and spent his early years at Clitheroe,

Lancashire, where he was educated at the grammer school and at the age of sixteen received the honoratus prize. Later he attended Owens College at Manchester and became proficient in analytical chemistry in preparing for the business of paper manufacturing at the Primrose Works in that city.

From an early age Mitchell was a keen student of birds and maintained his interest in them until his death. He was recognized as an authority on the birds of Lancashire. In addition to short papers on 'Ornithological Notes from Lancashire,' 1881, and 'Birds of the Stonyhurst District,' 1888, he published 'The Birds of Lancashire' in 1885, the standard work on the avifauna of that part of England. A second edition edited by Howard Saunders appeared in 1892, Mitchell in the previous year having removed to Canada. He first settled at Edmonton, Alberta, but later took up his residence in British Columbia, where he remained until his death. He is survived by his widow, two sons, and two daughters.—T. S. P.

Dr. Leigh Hunt Pennington, an Associate of the American Ornithologists' Union, elected in 1927, died of heart failure in Washington, D. C., April 24, 1929. Doctor Pennington was born at Macon, Mich., Oct. 26, 1877, and was a graduate of the University of Michigan, where he took the degrees of A.B. in 1907 and Ph.D. in 1909. He served in the University of Michigan as assistant botanist from 1906 to 1909, instructor in Northwestern University, 1909–10, assistant professor and professor in the University of Syracuse, 1910–14, and professor in New York State College of Forestry since 1914. At the time of his death he was on leave of absence and was engaged in special work at the Department of Agriculture. He was interested primarily in forestry, plant physiology and pathology, and also in birds and conservation.—T. S. P.

NOTES AND NEWS.

THE HISTORY OF ORNITHOLOGISTS is often quite as interesting as the history of ornithology, especially when it descends from the stilted formality, so often characteristic of history, and gives us pictures of real life, full of humorous anecdotes and good natured fun. Such a piece of history is Harry Swarth's 'History of the Cooper Ornithological Club' which has just come to hand. Besides the admirable history there are here preserved early photographs of groups of members, on field trips and early portraits which show dignified present day ornithologists as callow youths. Every ornithologist we think should enjoy reading such a history for there must needs be much in the life of a successful ornithological club besides ornithology, and we cannot imagine a good field ornithologist without a sense of humor.

The Cooper Club has achieved much in ornithology and has won well-merited praise and we now congratulate it upon a history that so well portrays its personal side and the spirit of jolly good fellowship that has ever marked its progress.

THE YEAR 1929 has brought many changes in Ornithological Journals.

In France the 'Revue Francaise d'Ornithologie' has combined with 'L'Oiseau' both titles appearing on the cover of the journal which is divided into two parts the former treating of general ornithology and the latter of aviculture.

Certain French ornithologists thinking that there is still room for two distinct journals have started a new bi-monthly publication, 'Alauda', devoted entirely to ornithology exclusive of aviculture. It is conducted by a Committee of eight, and is managed by Mons. P. Paris, Faculte des Sciences, 51 rue Monye, Dijon (Côte-d'Or). Subscription 50 Fr. per year.

The Association of Hungarian ornithologists and the Society for Bird Protection in East Hungary have started an excellent quarterly entitled 'Kocsag' (=the White Egret). Dr. Eugene Greschik, Hungarian National Museum, Budapest 80, is co-editor and manager. Subscription 6 P. per annum.

Among avicultural publications is an excellent German journal 'Vögel ferner Länder' published by the Austausch-Zentrale. Printed by F. E. Haag, in Melle, Germany.

Also the 'Avicultural Magazine' now changed to 'Aviculture' published by the Avicultural Society of America, 15 Park Row, New York City.

Smaller journals are 'The Wren Tit,' the neatly printed quarterly bulletin of the Santa Clara Valley Audubon Society and 'The Flicker' the mimeographed bi-monthly bulletin of the 'Minnesota Bird Club,' Charles Evans, 3250 47th Ave., S., Minneapolis.

THE ANNUAL Heath Hen census on Marthas Vineyard Island, March 30 to April 3, 1929 disclosed the presence of only the single male bird noted the previous December. The former haunts of the species were thoroughly combed and in spite of a reward of $100 for the discovery of a single additional bird none was found. As Dr. Gross says in his brief report "the death of this bird will also mean the death of its race."

FROM THE CIRCULARS of the U. S. Biological Survey we learn that there is no intention of establishing an open season for Swans and these beautiful birds will continue to enjoy the safety that they so well deserve. We cannot imagine any sportsman who has seen the winter flock on Currituck Sound desiring to have these birds again put in the class of legitimate game.

PRESIDENT HOOVER has created another bird sanctuary comprising 57,000 acres formerly a military reservation near Miles City, Mont., to be known as the "Fort Keogh Bird Refuge." Meanwhile Senator Fletcher of Florida has introduced a bill in Congress calling for a report on the advisability of establishing the "Tropic Everglades National Park" to save to posterity a portion of tropical Florida. Ernest F. Coe, who is an active advocate of the park, has an extremely interesting account of this region in the March 1929, issue of 'American Forests.'

AFTER NEARLY forty years with the Biological Survey and more than fifty years in the government service, Dr. Edward W. Nelson was retired, at his own request, on May 8, 1929. His work with the government began in 1877 when he was sent to Alaska under the auspices of the Smithsonian Institution to make meteorological observations for the Signal Service.

Since his retirement as chief of the Survey Doctor Nelson has been engaged chiefly in preparing for publication of his report on natural history collections in Lower California, on special field investigations of big-game animals and birds, and on taxonomic revisions of important mammals. He will continue scientific work, with residence at the Cosmos Club, Washington.

ACCORDING TO THE DECISION of the VI. Ornithological Congress held at Copenhagen in 1926 the VII. International Ornithological Congress will meet in Amsterdam in 1930, probably from the 1st till the 8th of June. President of this Congress will be Professor Dr. Einar Lönnberg, Stockholm, elected by the Congress at Copenhagen, Honorary Secretary, Professor Dr. L. F. de Beaufort, Director of the Zoological Museum, Amsterdam. The following gentlemen have accepted an invitation to serve on the Executive Committee of the Congress: Count E. Arrigoni degli Oddi, Dr. Frank M. Chapman, J. Delacour, Dr. E. Hartert, Dr. O. Helms, Heim de Balsac, Dr. O. Heinroth, P. Hens, Dr. Percy R. Lowe, Dr. G. J. van Oordt, W. L. Sclater, Dr. E. Stresemann, Prince Taka Tsukasa, Dr. A. Wetmore.

Further particulars will be announced later on.

As previously announced the next stated meeting of the American Ornithologists' Union will be held in Philadelphia, at the Academy of Natural Sciences, October 21–25, 1929. Everyone should make their arrangements now, in order that nothing shall interfere with their attendance. Those who have not attended previous meetings are especially urged to be present. These gatherings are always an inspiration to those who participate in them.

The Editor wishes to express his deep obligation to Mr. William Vogt, of Hastings-on-Hudson, N. Y., who at the beginning of the year most generously offered to read the proof of 'The Auk' and has continued to do so most ably. This is a service the importance of which any editor will appreciate.